# The Canadian Medical Association Journal

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VOL. I. TORONTO, MARCH, 1911 No. 3

## Contents:

| | PAGE |
|---|---|
| Malignant Disease in the Neck. By A. Primrose, M.B., C.M., Edin., M.R.C.S., Eng. | 199 |
| Experience with "606": A Preliminary Report. By J. G. Adami, M.A., M.D., F.R.S., and R. P. Campbell, M.D., and F. S. Patch, M.D. | 209 |
| Tuberculin in the Diagnosis of Tuberculosis. By J. C. Meakins, M.D. | 223 |
| Food Standards. By A. McGill, M.A., LL.D. | 232 |
| The Inflammatory "Pelvic Mass." By W. W. Chipman, M.D., F.R.C.S.E. | 239 |
| **CASE REPORTS** | |
| Cerebral Meningocele. By N. E. McKay, M.D. | 247 |
| Operation for Pott's Disease of the Spine. By A. Mackenzie Forbes, M.D. | 249 |
| **EDITORIAL** | |
| A Vision Realized | 251 |
| Hospital Troubles in Halifax | 254 |
| Expert Evidence | 258 |
| Teaching by Pantomime | 260 |
| Railways and Typhoid | 261 |
| Government Laboratories | 262 |
| The Journal and the Profession | 263 |
| Physical Education | 265 |
| **BOOK REVIEWS** | |
| American Practice of Surgery | 267 |
| Modern Surgery | 268 |
| A Text-Book of Surgery for Students and Practitioners | 269 |
| **RES JUDICATÆ** | |
| Human and Bovine Tuberculosis | 270 |
| **RETROSPECT OF SURGERY** | |
| Clinical Remarks on 348 Cases of Injury to the Eyes | 273 |
| The Clinical Congress of the Surgeons of North America | 279 |
| Acute Thoracic Empyema | 282 |
| Personal | 284 |
| News | 284 |
| Obituary | 286 |
| **CANADIAN LITERATURE** | |
| Original Communications | 287 |
| **MEDICAL SOCIETIES** | |
| Montreal Medico-Chirurgical Society | 288 |
| Ottawa Medical Society | 289 |
| L'Association Médicale du District d'Ottawa | 290 |
| Société Médicale de Montréal | 290 |
| Ontario Medical Association | 290 |

XUM

# The Canadian Medical Association

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The Canadian
Medical Association Journal

VOL. I. MARCH, 1911 No. 3

# MALIGNANT DISEASE IN THE NECK

BY A. PRIMROSE, M.B., C.M., Edin., M.R.C.S., Eng.

*Surgeon to the Toronto General Hospital; Associate Professor of Clinical Surgery in the University of Toronto*

THE subject which I wish to discuss in this paper is that of certain types in malignant disease which occur in connexion with the lymph glandular system of the neck, with special reference to Hodgkin's disease, lympho-sarcoma, and carcinoma. The view that Hodgkin's disease and lympho-sarcoma are identical is apparently gaining ground. Thus, Coley, Banti, and others hold this opinion, and, again, Yamaski believes that under certain conditions Hodgkin's disease may become sarcomatous. There would appear, also, to be some ground for the belief that carcinoma and sarcoma may be closely associated. Experimentally it has been shown by Ehrlich that in the transplantation of mouse carcinoma typical sarcoma developed in the twelfth generation. Loeb observed a similar transformation in the second generation, whilst Coley has recorded in his clinical observations two cases in which primary sarcoma existed with sarcomatous metastases.

It is not the intention of the author to discuss in any detail the question of the relationship of these various diseases. Clinically, in Hodgkin's disease, we have discrete, separate enlargements of the glands, with, as a rule, no fusion, these differing very markedly from the firm adhesions which result from periadenitis in tuberculous disease. In the latter, caseation may be noted as an additional characteristic manifestation. Then, again, in the typical sarcomatous development, we find infiltration of the gland capsule, and sooner or later neighbouring glands are involved along with the tissues in which these glands lie.

Blood changes may be entirely absent in Hodgkin's disease, and,

Read before the Medical Association of the county of Oxford.

in fact, this affection may run its course to a fatal issue without producing other than a secondary anæmia. On the other hand, whilst lympho-sarcoma may present a precisely similar picture, as far as the absence of blood changes is concerned, yet occasionally malignant glandular involvements are accompanied by blood changes which may be sufficiently marked to constitute the condition described as lymphatic leucocythæmia. In the consideration of the confused medley of facts regarding malignant glandular involvement, one is encountered by a further observation which may be recorded; namely, that blood changes may be marked, and what is known as lymphatic leucæmia may be present and may persist to a fatal termination without the occurrence of any marked glandular involvement. One may, therefore, suggest the possibility that we have two extremes in the clinical manifestation of diseases which are closely associated, the one, lymphatic leucæmia, in which there may be extreme blood changes without neoplastic formation, and the other, lympho-sarcoma, in which there is definite neoplastic development without the existence of blood changes. Between these, many mixed varieties exist where blood changes and neoplastic formation are associated in varying degree.

It would appear that too much importance must not be placed upon the fact that Hodgkin's disease may occasionally exist with the manifestation of a tendency to infiltration of the gland capsule. Here, again, it would seem, from a study of the pathological histology of these conditions, that there is great variation in the degree in which infiltration occurs, and we are inclined to think that the distinction formerly insisted upon in this regard is of no great practical value.

The manner in which a sarcomatous growth spreads in the neck is illustrated in the following case:

Case 1. A small-celled sarcoma occurring in the neck of a child, presumably originating in the lymph glands. The child was four years of age, and was admitted into hospital with a large tumour at the root of the neck, which had originated two and a quarter years previously in the region of the right lobe of the thyroid gland. The tumour was of large dimensions, so that circumferential measurements of the neck were more than twice the normal, and yet it produced no pressure symptoms, except a little difficulty in swallowing. The case was inoperable, and the child died during the night, suddenly and unexpectedly. Microscopic examination proved that the growth was a small-celled sarcoma. Metastases were found in the lung having a similar structure.

A series of frozen sections, one of which is reproduced in Fig. 1, were made through the head and neck, and study of these show-

ed some interesting points which are worth recording. There was infiltration and complete disappearance of many of the muscles of the neck, e. g., the sterno-mastoid. In addition, the great vessels upon the side on which the growth was had also disappeared. It seemed probable that the tumour had, first of all, by simple pressure, caused occlusion of the blood vessels, and had subsequently infiltrated the coats of the occluded vessel and incorporated its structure with that of the growth itself, so that eventually the blood vessels, as such, became wholly unrecognizable. Whilst this was the case, the growth was highly vascular, but none of the blood vessels throughout its substance were of any very considerable size.

The various viscera in the neck—larynx, trachea, pharynx, œsophagus—were displaced without being involved. This is somewhat remarkable, in view of the degree of displacement, for a somewhat extensive development of sarcomatous tissue existed in front of the lower cervical and upper dorsal vertebræ, between the spine and the œsophagus. The apex of the lung itself was considerably displaced. There was no involvement of bone, whilst, at the same time, the growth passed within the spinal canal, apparently through the intervertebral foramina, and extended around the spinal cord. It is quite apparent from a study of this case that, in this particular instance, the malignant tumour spread in the direction of the least resistance, apparently along fascial planes, and, whilst muscular tissue was extensively destroyed, there was no tendency to ulceration of the skin and superficial structures, nor invasion of the bone. The fact may supply one reason why it is that, occasionally, after operative interference, these malignant tumours spread with increased rapidity. The probability is that, by our incisions, fascial barriers are destroyed, and then new planes of tissue are opened up for a further spread of the disease.

The clinical picture of Hodgkin's disease is too well known. I may cite two cases from my note book:

Case 2. Mrs. M., age, twenty-seven, with a history of tumour beginning in the neck eighteen months previous to examination. The growth, which was painless, increased slowly in size, involving the neck region extensively, and spreading up over the angle of the jaw on the left side. She had lost fifteen pounds in weight, but, otherwise, her general health was not in any way affected. A gland was removed under local anæsthesia, and the microscopic examination showed conclusively that the condition was malignant, that is to say, a rapidly growing lymphoma, in which, too, one observed a tendency, though not marked, towards infiltration of the gland capsule. The *x*-ray picture showed a mass of tumour growth in the

mediastinum above and surrounding the pericardium. There were also some glands in each axilla. The blood changes were nil. The patient died after a few months' illness.

Case 3. Mr. P., age, thirty-four. Clinically this patient resembled the one which I have just described, but the tumour growth was much more rapid. Four years previously the patient had his tonsils removed because of enlargement. Four months prior to observation, the growth in the neck made its appearance, and, at the time of first examination, formed a large tumour situated in the upper part of the neck and extending up behind the angle of the jaw. The growth was removed, by a difficult dissection, along with the internal jugular vein from the clavicle to the base of the skull. The hypoglossal and spinal accessory nerves were necessarily sacrificed, and it is interesting to observe that the left vagus was inadvertently included in the pressure forceps for some five minutes without producing any noticeable effect. A microscopic section showed that this growth was a very rapidly growing lymphoma with marked infiltration of the gland capsule. The *x*-ray was employed after the operation, but recurrence led eventually to a fatal issue.

The type of cases where marked blood changes occur without tumour formation is often very rapidly fatal, as in the following patient:

Case 4. Mr. B., age, thirty-nine, had previously enjoyed excellent health, but during a summer holiday began to fail rapidly, and died in three months' time. The blood examination a few weeks before death showed the characteristic features of acute lymphatic leucæmia, with enormous quantities of lymphocytes and hæmoglobin reduced to twenty-seven per cent.

The cases where tumour formation is the predominant feature frequently seek aid from the surgeon, and the question arises as to whether or not we are able to afford any measure of relief. Excision is absolutely futile, even where the disease is not advanced, as in the following case:

Case 5. Mrs. C., age, seventy-three. A hard, firm, movable tumour had appeared in the neck beneath the lower jaw. It slowly increased in size for about one year. Three large glands were removed, and this seemed to constitute the entire manifestation of disease. Microscopically it proved to be a malignant lymphoma of the infiltrating type. Six months subsequently the patient failed markedly in health, tumour formation reappeared in the neck, and there were now palpable glands both in the axilla and on the left side of the neck. Glands were also detected in the epigastrium, and the patient rapidly succumbed.

Coley's fluid, consisting of the mixed toxins of erysipelas and bacillus prodigiosus, has been tried in these cases, but it is of no value. The *x*-ray treatment is somewhat more hopeful, and, undoubtedly, tumour growth will often diminish markedly and will occasionally disappear. But permanent cure does not result, and, whilst we continue to employ it, we feel that it is far from satisfactory, and that it cannot do more than retard the progress of the disease, and possibly prolong life for a time. The treatment by radium is now coming into vogue, and, whilst we cannot speak from any personal experience, yet it is noteworthy that these tumours have been caused to disappear under radium treatment, but the cases thus far reported have not been followed long enough to determine whether the relief has been permanent or not.

CARCINOMA: The following cases may now be cited illustrating carcinomatous development in the glands of the neck. One may say that such occurrences are always secondary and never primary, the reverse being true of the sarcomatous conditions already described. There is often a difficulty in diagnosing carcinoma in the glands of the neck, and the necessity for routine examination of all tissue removed from this locality is illustrated in the following case:

Case 6. Mrs. X., age, fifty, was first seen on November 17th, 1904, having previously had enlarged glands on both sides of the neck. She had pain and had a temperature of 104. An incision through the œdematous tissue opened up an abscess behind the pharynx on the right side of the neck. Nine days later, the temperature having again risen, a similar abscess was opened on the left side of the neck. Four months subsequently, because of tumour in front of the sterno-mastoid muscle, an incision was made through what was apparently dense cicatricial tissue. Microscopic examination revealed, what we had hitherto not suspected, nests of squamous epithelial cells embedded amongst the dense fibrous tissue. Believing this carcinomatous growth to be of secondary origin, a careful search was made for the primary lesion. There had previously been some slight dysphagia, but serious trouble was not suspected. Laryngoscopic examination showed marked infiltration of the right arytenoid, the ary-epiglottic fold, and the ventricular bands, but there was no visible ulceration. The patient consulted some one in New York, who opened up the neck and inserted a tube of radium, which had the effect of producing an extensive and painful burn. Subsequently marked dysphagia developed, and it was found impossible to pass an ordinary œsophagea tube. The patient was sustained by milk administered through a soft catheter and later by nutrient enemata. Obviously, a malignant growth had

XUM

been present in the larynx, which had eventually spread to the pharynx, and this, doubtless, was the primary lesion. About one week before death, which occurred in November, 1905, a mass was discovered in the left side of the pelvis, the nature and connexions of which it was impossible to determine. An autopsy was not permitted.

Another case may be cited illustrating the difficulty in localizing a primary lesion:

Case 7. Mr. P., age, thirty-eight, for some time had a mass on the right side of the neck. On October 27th, 1908, operation was undertaken. The sterno-mastoid was divided, and a mass was dissected out from the base of the skull to the clavicle along with the internal jugular vein, bearing the carotid and the vagus. A clean dissection was accomplished. It proved to be a squamous-celled cancer, and a small, primary patch was found in front of the anterior pillars of the fauces and removed immediately. It was barely the size of a ten cent piece.

Again, there is the possibility of the development of secondary carcinoma in the neck, without discovering the seat of the primary lesion, although careful search is made, as in the following instance:

Case 8. R. A., age, twenty, was admitted August 25th, 1908. The lad had been operated upon elsewhere some months previously for what was supposed to be tubercular glands, but no examination was made. On admission, he had a great mass of glands on both sides of the neck. I operated on the right side and removed a mass with a considerable portion of the sterno-mastoid muscle, which was infiltrated, also the internal jugular vein in its upper portion. Thirteen days later I operated on the left side of the neck, and removed a chain of glands from the base of the skull to the clavicle. The posterior half of the sterno-mastoid muscle was removed along with the old cicatrix. The internal jugular vein was excised from the angle of the jaw to the clavicle. The upper portion of the mass was very firm and hard, and was adherent in parts. There was marked cyanosis of the face, when the vein was ligated, but this soon disappeared. It was an exceedingly difficult dissection, lasting two and a half hours. A careful examination of the mouth, larynx, and pharynx failed to detect any evidence of primary growth. Microscopic examination showed that the mass was carcinomatous, of the squamous-celled type. He died some months subsequently with recurrence.

The following case illustrates conditions where there is no doubt as to the seat of the primary trouble and the course of secondary glandular involvement in the neck:

Case 9. Mr. D., age, fifty-six. The anterior part of the tongue,

Fig. 1—Sarcoma of the neck in a child two years of age. Section at the level of the first dorsal vertebra. Note displacement of the œsophagus and trachea: the presence of new growth within the neural canal: the disappearance of the great vessels on the side of the neck in which the growth exists.

Fig. 2—Showing openings into an excavated portion of the neck which had previously been occupied by a large carcinomatous mass. The growth disappeared under the influence of the *x*-ray.

XUM

with a large portion of the left side, was removed for epithelioma. There was no glandular involvement. Six months subsequently the submaxillary glands of the right side were removed because of secondary trouble, and, after the lapse of seven months more, a tumour was removed from the left side of the neck, deeply seated, where it was found necessary to excise a portion of the left internal jugular vein. After two months, a mass on the right side of the neck, with some three inches of the internal jugular vein, was excised. Subsequently he was subjected to *x*-ray treatment, the growth having recurred with considerable rapidity on both sides of the neck. Under the *x*-ray the growth was affected in quite a remarkable manner, Fig. 2. It first of all became softened, and there were formed a number of sinuses which discharged a thin, serous material, until great excavations in the neck were substituted for the prominent growths. One night he had, suddenly, a terrific hæmorrhage from the right side, and died from its effect four hours subsequently, exactly two years after the primary operation.

It is somewhat remarkable that malignant disease of the thyroid gland is so seldom accompanied by metastases, and that, at the same time, carcinoma of the thyroid is singularly fatal, so that the outlook in such cases is absolutely hopeless. The following may be given:

Case 10. Mrs. C., age, sixty-four, had suffered from goitre for twenty years without any inconvenience. Six weeks before admission she suffered great dyspnœa from pressure. The peculiarity of the tumour was that it was of stony hardness and was firmly fixed. The left vocal cord was paralyzed. Operation was performed and the tumour removed. Part of the growth was calcareous, but the softer part was found, under the microscope, to be carcinomatous. The patient was temporarily relieved of her distressing symptoms, but the growth recurred without metastases, and she died three months subsequently.

The group of cases which I have cited do not show any brilliant results, but I have chosen them deliberately because they are instructive. With regard to the relationship between the primary and secondary manifestation of carcinoma, we learn that the primary focus may be entirely overlooked, and in this connexion may I remind you that secondary involvement of the glands at the root of the neck may occur in carcinoma of the cardiac end of the stomach and the gullet. Two such cases have come under my observation recently, one at present in my hospital service. Such a possibility, therefore, should be borne in mind while hunting for the primary focus when the glands at the root of the neck are carcinomatous.

XUM

I have instanced several cases where extensive secondary growth occurred in the neck, whilst the primary focus was quite insignificant, and such are apt to be misinterpreted, unless one makes it a rule, to which there should be absolutely no exception, to examine microscopically all tumour growth removed from the neck, no matter how simple the case may seem, nor how apparently clear the diagnosis. If it is important in such cases to find and remove the primary growth, if possible, it is equally clear that, in those cases where a primary growth of a carcinomatous character is discovered, we should not wait for gross secondary manifestations, but should proceed at once to remove the lymph glands, which one would expect to become involved in the individual case. Let me give you two illustrations which are most instructive. A man sixty-four years of age had a small ulcer, the size of a twenty-five cent piece, on the inner side of the cheek opposite the first two lower, molar teeth. This was removed, and proved to be carcinomatous. There was no trace of glandular involvement. Fifteen months subsequently he came to me with slight glandular involvement in the submaxillary region. He would not submit to operation until two and a half months later, when a very extensive dissection was necessary to remove a mass which, by that time, had involved the tissues widely. There had been no recurrence at the seat of the primary focus. The second case was that of a man on whom I operated ten days ago for a small epitheliomatous ulcer of the lower lip. There was no palpable, glandular involvement, but I dissected out the glands and fascia of the submaxillary region, and found, microscopically, that a lymph gland was the seat of carcinomatous invasion. It was impossible to have suspected this by gross inspection. It is necessary to insist on the removal of the glands in all such cases, as a routine practice. The single case which I have cited is enough to show conclusively the necessity for this, and yet, in many of our text-books, the principle is not insisted upon.

As to treatment of carcinoma in the neck, there can be no doubt of the fact that the best prospect for permanent relief is early recognition and free excision. The effect of Roentgen rays and their destructive action on carcinoma is illustrated in one of my cases reported above, and at present radium is being used extensively as a measure of relief. But, at best, both the *x*-ray and the radium are of questionable value, and it is doubtful if carcinoma can be eradicated by means of either.

The technique of operation is at present attracting much attention. Crile has urged with force that cancer of the head and neck is primarily a local disease, and that "the collar of lymphatics of the neck forms

an extraordinary barrier through which cancer rarely penetrates." On these grounds he argues that the logical technique is a "block" dissection of the regional lymphatic system as well as the primary focus, applying the same principles here as those which are now practically universally adopted in excision of the breast with the pectorals and lymph glands for cancer. We concur most thoroughly with these conclusions. Experience teaches us the wisdom of such a course and the absolute folly of incomplete operations.

Regarding the tissue which may be sacrificed in such dissections for carcinoma, we have already observed in the cases cited that the internal jugular vein may be sacrificed on one or both sides of the neck, if need be. The common carotid artery or the internal carotid should never be ligated in patients of middle age or older. I was tempted once, as a forlorn hope, to tie the common carotid in a man of seventy-five, with carcinoma of the neck secondary to a growth on the lip. Two days subsequently he developed cerebral softening with hemiplegia. In young people the common carotid may be tied with little risk if the vessels are healthy. Some years ago, I assisted a senior colleague in tying the common carotid artery, first on one side of the neck, and, a few months after, on the other side, without harmful results. This operation was undertaken for arterio-venous aneurism. But such a procedure would be out of the question in patients, at the cancer producing age, with diseased vessels. The risk of ligating the external carotid is comparatively slight, and may be undertaken, if necessary. Crile finds that unilateral division of the vagus nerve is attended by little other than hoarseness of the voice, and that bilateral excision is uniformally fatal. One hypoglossal nerve may be excised, but incision of both is fatal, the paralysed tongue falling back in the throat. The facial nerve is occasionally sacrificed, more frequently its inframandibular branch, this producing, of course, serious disability. One phrenic nerve, likewise, may be sacrificed. The voluntary muscles of the neck may be removed fairly extensively. Crile has removed both sterno-mastoid muscles with only a small degree of inconvenience to the patient. We have removed such muscles as the digastric, mylohyoid, and platysma, where it was necessary to do so.

We agree with Crile in looking upon cancer of the head and neck as a purely local disease, in its early stages manifesting a primary focus and secondary glandular involvement. The only treatment at present which holds out a prospect of permanent relief is early excision by the knife, and we have learned the folly of incomplete operations. There should be no exception to the rule that, where the primary focus is excised, the regional lymph glands should also be extirpated with

XUM

the gland-bearing fascia, no matter whether or not there is gross involvement of the glands. Here, as in cancer of the breast, an incomplete operation is not only bad surgery, it is almost criminal, because we may, by such a procedure, throw away the only chance there is for radical extirpation, which alone can preserve life.

# EXPERIENCES WITH "606": A PRELIMINARY REPORT

By J. G. Adami, M.A., M.D., F.R.S.
*Professor of Pathology, McGill University*

and R. P. Campbell, M.D., and F. S. Patch, M.D.
*Montreal General Hospital*

Introduction by Professor Adami

IT will be most serviceable, I think, to those here present, if, this evening, I leave to Dr. R. P. Campbell the matter of the method of employment of "606" and the results that he has obtained from that employment, and confine myself to a description of the successive steps which have led up to the discovery and employment of this drug. Doing this, I must of necessity dwell upon the life-work of one who, with Metchnikoff, stands forward as the foremost man of science in the domain of medicine of our generation, who, indeed, not long ago divided with Metchnikoff the Nobel prize. While their points of view are wholly different, there is not a little similarity between them in the way in which the development of their work has led them to the enunciation of theories of immunity and of the cure of disease, which have had the profoundest influence upon their fellow-workers, and in the way in which, seeking to test basal principles, they have been led into wider and wider fields of research.

For now twenty-five years, and more, Professor Paul Ehrlich has been engaged in the endeavour to translate principles of therapeutics into practice. What I may term the "basal idea" that would seem to underlie Ehrlich's scientific life is that cell activity is essentially chemical, that the specific reactions of specific cells are due to chemical modifications in the composition of their specific cell substance. Thus, long years ago, he recognized that the differential staining of cell structures must signify the existence of specific chemical substances within those cells, and so the formation of different chemical compounds with staining reagents. It is to Ehrlich that we owe our knowledge of the basal principles of the employment of aniline dyes in cytological and histological work, and, incidentally, the recognition of the different

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XUM

forms of leucocytes, possessing granulations that have specific, tinctorial properties. It is almost natural that these exact studies into the finer molecular structure of cell protoplasm led Ehrlich to recognize the chemical groundwork of immunity; that for bacterial toxins to produce their results in the organism they must enter into direct union with the cell; that where immunity is produced it is by the elaboration and over-production on the part of the cell molecules of side-chains which enter into a chemical and neutralizing union with the molecules of toxin. I need not tell you how Ehrlich's side-chain theory has dominated research upon immunity during the last fifteen years.

In 1899, the Royal Institute for Experimental Therapeutics was established at Frankfort, with Ehrlich as director, and here came his great opportunity. As he points out in the preface to his recent work "Experimentelle Chemotherapie der Spirillosen," which he was so good as to send me at Christmas, it was this appointment that gave him the opportunity to advance therapeutics along a new line; to employ chemical synthesis directly for the service of medicine. Up to the time of the foundation of that Institute, and, as we all know, up to the present year of grace, the custom has been for chemists to elaborate chemical compounds and then invite the therapeutist to test their products. It is the chemist who has afforded drugs to the medical man, and not the medical man who has suggested the formation of particular compounds to the chemist. Individual pharmacologists, it is true, have made prolonged studies upon groups of allied compounds to determine their relative efficiency, but, to my knowledge, no one, prior to Ehrlich, had taken up the opposite, truly scientific, attitude of the therapeutist directing the chemist to elaborate particular series of compounds, so as to determine which among these combines to the fullest extent a particular order of properties. It is to this line of work that Ehrlich has devoted himself all these later years, with the aid of a brilliant staff of chemists and experimental pathologists, even if, at the same time, he has been directing that abundant work upon immunity against infection and malignant growths for which the Frankfort Institute has become celebrated.

The study of human and animal trypanosomiasis with its crowding of the circulating blood with large and easily recognizable protozoan forms—forms more highly differentiated and, presumably, therefore more susceptible than the bacteria—afforded Ehrlich what appeared to be a promising field. It was in 1904 that Ehrlich and Shiga determined to investigate the trypanosome disease *mal de caderas* in white mice, selecting these because of their cheapness, which permitted large numbers of animals to be tested, and because the course of the

infection in these animals is constant, death occurring with singular regularity on the fourth or fifth day.

Ehrlich and Shiga had little to guide them at the start. As a matter of fact, they tested more than a hundred compounds before they came upon a red aniline dye belonging to the benzopurpurin series. This, it is true, had not great activity; it merely lengthened the course of the disease. But this gave the start; and now Weinberg, under Ehrlich's direction, made a long series of substitution compounds of this dye, and produced several chemically allied bodies, until eventually another red dye, the so-called "trypanrot," was found, which, by a single injection of the proper dose, effected a permanent cure in a certain number of the mice tested.

Far from all the mice treated recovered; according to Nicolle's observations less than fifty per cent. (six out of fourteen). And although Ehrlich and his co-workers, and Nicolle and Mesnil made further extensive studies upon the benzidine and basic biphecyemethyme dyes, the results can only be said to have had a *succes d'estime*.

It was left to a Canadian, a McGill graduate, and, I may add, a late Fellow in Pathology of our university, to make the decisive step forward. Prior to 1904, the only drug that had been found at all influential in the treatment of trypanosomiases was arsenic,—whether as Fowler's solution, as sodium arsenite, or arsenious acid. But this was found, at most, to prolong, not to cure, the diseases. Seeking for less toxic arsenical compounds, Thomas tested atoxyl, which, known for thirty years or more, had already been used for some three years in the treatment of skin diseases and anæmias. This, while containing 24·1 per cent. of arsenic, has only one-fortieth of the toxicity of Fowler's solution (Blumenthal). And in the animals of the laboratory, Thomas gained some striking permanent cures—his results being rapidly confirmed by Uhlenhuth, Nicolle and Mesnil, Ehrlich, and others in nagana, surra, *mal de caderas* and, last and most important, in the sleeping sickness of man. If not surely curative it is generally agreed that this is the best agent so far provided.

Now the spirilloses, or, more accurately, the spirochætoses, the group of relapsing fevers, are due to organisms which similarly appear in great abundance in the blood, and, according to Schaudinn, these organisms are zoologically closely allied to the trypanosomes. Uhlenhuth, in 1907, working by analogy, next tested the efficiency of the arsenic compounds in a disease of this order—the spirillosis of fowls—and here it was found that atoxyl exerted a pronounced curative action followed by lasting immunity.

It is interesting to note that atoxyl has little effect in connexion

XUM

with another member of this group; namely, the African tick fever of Dutton and Todd, whether in animals of the laboratory (Vassel), or in man (Breinl and Kinghorn). As regards European relapsing fever the results are indecisive.

Closely allied to the spirochætes are the treponemas, as the organisms of syphilis and frambœsia or "yaws" are more accurately designated. Naturally, endeavours have been made to test those different drugs upon syphilis. The last few years have abundantly demonstrated the relationship of the treponema pallidum to this disease. Further, it has been shown that rabbits can be inoculated with the disease with the production of typical chancres (Dr. R. P. Campbell has repeatedly produced these), so that the disease at last offers admirable material for experimental investigation And, as early as 1907, Uhlenhuth demonstrated that atoxyl had a preventive action on this disease in the rabbit. But he, Metchnikoff, and others, gained only what may be termed incomplete results. They could arrest the disease before the development of the chancre, but not surely after. Those also who have treated human syphilitic patients with atoxyl have, to put it briefly, obtained results which are of the same order as, and not superior to, modern mercurial treatment, with the disadvantage that in a certain proportion of cases eye troubles and blindness have supervened.

It was at this stage that Hata, a pupil of Kitasato, came to work under Ehrlich, and the endeavour to find yet more powerful agents acting against the spirilloses was renewed. Employing the organisms of relapsing fever as his main test, Hata tested some two hundred aniline dyes with imperfect results, then turned to the arsenical compounds, beginning with atoxyl. His drug No. 592 was dioxydiamido-arsenobenzol. This he found eminently effective, but recommended the hydrochlorate, No. 606, as the more satisfactory to work with, since it entered into solution with less difficulty.

Here, at last, was a sure and safe preventive and curative agent against relapsing fever in mice and rats, free from setting up unpleasant after-effects upon the nervous system—tremors, blindness, etc.

He traced a series of derivatives and combination products, none of which gave surer results. Employing this "606" with the spirillosis of birds, he obtained even more striking effects. And now turning to the experimental syphilis of the rabbit he determined that a single injection of the adequate dose of "606" led to a complete disappearance of the spirochætes within twenty-four hours. It has to be added that, following upon this work, Nichols, of the United States Army, has demonstrated that "606" has a like effect upon rabbits and apes inocu-

lated with the spirochæte of frambœsia or "yaws." Iversen, of St. Petersburg, has shown its remarkable effects in curing relapsing fever in man (fifty-five cases), the spirochætes disappearing from the blood in from seven to twenty hours. In ninety-two per cent. of the cases there was no recurrence.

As regards the treatment of human syphilis with this agent, I need here say little, leaving that to Dr. R. P. Campbell, beyond this, that with praiseworthy care Ehrlich determined not to place the drug in the possession of practitioners in general until it had been tested in many thousands of cases by responsible men in various countries. It is thus that through the Rockefeller Institute and my friend Dr. Flexner, I received from Professor Ehrlich ten doses to test. Here I may note that the Rockefeller Institute has contributed generously to the expenses of this prolonged research. These doses I gave to one whose capacity all our members fully appreciate; and as the work has developed, with great generosity we have been afforded many more doses of "606," until to-night Dr. Campbell is in the position to give a thorough account of the efficacy of the drug in various stages of the disease. Having followed the work of Drs. Campbell and Patch with great interest, I cannot, however, forbear from noting two matters, which have especially impressed me. Of these the first is the extraordinary rapidity with which the drug acts upon the spirochætes; the fact that within four hours after an intramuscular injection the abundant organisms in a florid chancre were found to be dying. The second is this. You may recall that in the treatment of sleeping sickness, and other trypanosomiases of man and animals, with atoxyl it often happens that not all the trypanosomes are destroyed, and those that survive have been found by Ehrlich and others to be arsenic resistant. They eventually multiply, the disease recurs, and subsequent doses of atoxyl and other arsenic compounds are without effect. But as our colleague, Dr. Todd, was, I believe, the first to note in practice, this immunity is only to arsenic; the arsenic resistant forms remain susceptible to other trypanocidal drugs. This, I would urge, explains the value of the iodides in syphilis, when mercury ceases to have effects. As a matter of fact, quite the most interesting series of cases treated by Drs. Campbell and Patch is the group of mercury-resistant cases,—cases in which continued, and eventually heroic, doses of the drug have failed to influence the lesions, which, however, have healed up swiftly after a single dose of "606". The phenomena, it will be seen, are of the same order. I should not be surprised if in a certain number of instances, the dose of "606" given is found inadequate to destroy all the spirochætes, with resultant recurrence and development

XUM

of "606" resisting forms, which, in their turn, will be susceptible to mercury or the iodides.

## Report by Drs. Campbell and Patch

### Chemistry

The greater part of this work was carried out in the surgical service of Dr. J. Alex. Hutchison, who, to a large extent, is responsible for the work accomplished. The examination of the eye condition has been done in each instance by Dr. Hanford McKee. To our many colleagues who have aided us by their interest and help we would tender our sincere acknowledgement.

It is evident from what Dr. Adami has so well said that the demonstration by Ehrlich and Bertheim of the true composition of atoxyl was the first step in the synthetic chemistry which, with a definite end in view, gradually led, step by step, to the synthesis of the preparation "606." Arsacetin, or acetyl-atoxyl, odsuran, arsenophenylglycin, are intermediate only as substances which were produced during this period of research after an ideal; that is, they are not intermediate.

With arsenophenylglycin, indeed, a certain therapeutic result in both trypanosomiasis and syphilis was obtained. Through Prof. Ehrlich's generosity, Dr. J. L. Todd and one of us[2] were able to demonstrate this fact in animals during 1909; and it is known to every one that atoxyl and its derivatives have a definite action on syphilis. Chemically, however, these compounds and "606" are very different, a fact which still further increases our respect for the work accomplished. It is true that we may derive "606" from atoxyl by, as Ehrlich says, "a long, hard road," but it is prepared commercially by introducing arsenic into phenol. Those who are interested in the actual chemistry of the process are referred to Prof. Ehrlich's book. The most essential point, if one may so express one's self, where so many differences exist, is that the arsenic is here trivalent, whereas it is pentavalent in the former compounds.

It is, perhaps, not without interest to refer to the following formulæ as presented by Ehrlich:

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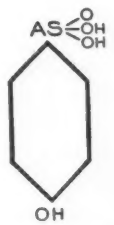
I.

Paramidophenyl arsenic acid of which the sodium salt constitutes atoxyl.

II.

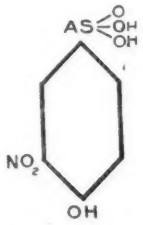
P-diazophenyl arsenic acid.

III.



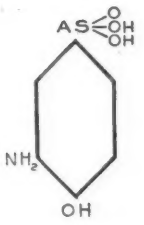

Paraoxyphenyl arsenic acid.

IV.



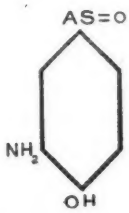

Metanitro-p-oxyphenyl arsenic acid.

V.



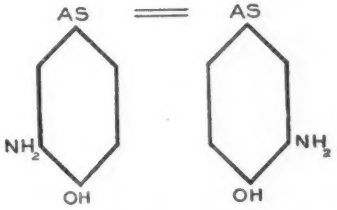

Metamido-p-oxyphenyl arsenic acid.

VI.




Metamido-p-oxyphenyl arsenic oxide.

VII.




Dioxydiamidoarsenobenzol or "606."

It suffices to note that dioxydiamidoarsenobenzol reacts as a weak base, that it has the power of uniting with either an acid or a base, that ununited it is unstable, becoming rapidly oxidized by the air, and that of its basic and acid salts the acid is the more stable. It is, therefore, as the acid salt that it comes to us, and this salt, the hydrochloride, is *in vacuo*, or under some inactive gas in glass capsules. Arsenobenzol (for short) is not readily soluble, but its salts are. On dissolving the chloride in water, a clear, acid solution is obtained, too acid to inject without unbearable pain. Sufficient sodium hydrate is, therefore, added to neutralize, when a precipitate occurs in large clumps. This precipitate is soluble in excess of sodium hydrate, and thus is given a strongly alkaline solution which is also painful on injection. If this is again neutralized, a precipitate is obtained which is finely divided.

It is possible, therefore, to inject: (1) the acid salt dissolved in water or suspended in an oily base (Kromayer[3]); (2) the alkaline salt in solution (Alt[4]); or (3) the neutral precipitate suspended in water (Wechselmann and Michælis[6]) or in oil (Stern[7]). Apart from any other consideration, the acid salt is so painful on injection as to prohibit its use. The neutral suspension is the least painful, but also, probably, the least effective. Watery solutions or suspensions are more painful than suspensions in oil, but are probably more quickly efficacious.

Manner of Injection. The manner of injection may be any of the following: (1) Intravenous—using a very dilute alkaline solution (Schreiber[8]). This causes no pain, but may cause such constitutional disturbances as diarrhœa and chill. It is the most intense in action but also the most fleeting. (2) Intramuscular—using any of the above preparations, the alkaline solution causing the most pain and the most infiltration, with some degree of necrosis (Orth[9]). (3) Subcutaneous—here the neutral suspension or the oily preparations only are possible, though attended by some risk on account of necrosis.

Absorption and Excretion. In so far as absorption and excretion are concerned, the intravenous injection is, as one might say, absorbed at once. It is, therefore, the most intense in action, but, as Fischer and Hoppe[10] have shown, it is excreted within a few days, so that by the fourth day little or no arsenic can be demonstrated in the urine. Its action is therefore soon over. The intramuscular injection is absorbed more slowly. Using the method of Alt[4], Fischer and Hoppe[10] showed the urine to be free from arsenic in thirteen or fourteen days, though Michaelis found some arsenic in the muscles six weeks after injection. Judged therapeutically, the most intense but most fleeting in its action is the intravenous, next the intramuscular

injection of Alt, and the slowest but most prolonged action is obtained by using the neutral or oily suspensions.

CASES AND RESULTS. Of the following twenty-six cases*, nineteen were treated after the method of Alt, and an alkaline solution injected intramuscularly into the gluteal muscles, the total quantity averaging fifteen to seventeen c.c., half being injected into each buttock. One case was treated according to Wechselmann's technique[5] (neutral suspension), and five by using a similar neutral suspension but with a lessened quantity of sodium hydrate, so that the bulk was considerably reduced (Blaschko and Ehrlich[20]), and one intravenously after Schreiber's method. The diagnosis was made in every instance not only from clinical signs but also from the finding of the spirochæta pallida or from a positive Wassermann reaction. The spirochæta pallida was thus demonstrated in all the primary and secondary cases. In the tertiary cases we depended for confirmation on the Wassermann reaction, which was positive in every case, with the exception of a case of cerebral syphilis that gave a very definite history but where the reaction was persistently negative.

The cases may be grouped as follows: primary syphilis alone, 3 cases; primary and secondary syphilis, 2 cases; secondary syphilis, 9 cases; tertiary syphilis, 8 cases; congenital syphilis, 1 case; cerebral syphilis, 3 cases. Out of the total, thirteen cases had been treated by mercury or mercury and potassium iodide, nine of whom may be considered to have been well treated and yet relapsed, and four as relapsing from insufficient treatment. Of the refractory cases, four were in the secondary stage, and the remainder tertiary.

The lesions were as follows: primary sore, 5 cases; lesions of mucous membranes, including angina, 9 cases; condylomata, 1 case; roseola, 3 cases; finely papular rashes, 2 cases; papular and papulo squamous syphilides, 5 cases; vesicular and erythematous syphilide, 1 case; rupia, 1 case; tertiary ulcerations, 3 cases; serpiginous syphilide, 1 case; osteitis, 2 cases; eye lesions, keratitis, 2 cases; eye lesions, retino-choroiditis, 1 case; laryngeal ulceration, 1 case; cerebral lues, 3 cases.

Without the detail of case reports the therapeutic effect may be briefly expressed as follows: PRIMARY SORE. In two cases where this was small, without secondary infection, and where the infiltration or ulceration was not great, it healed within one week. In one, where the infiltration formed a nodule 3x2x1 c.m., the ulceration disappeared within eight days, but a definite thickening persisted for one month

*Since presenting this report, we have treated some forty additional cases, mainly by means of the intravenous method.

XUM

afterwards. In another, where the ulceration about the meatus was as large as a twenty-five cent piece, the surface became clean in forty-eight hours, and new skin could be seen growing in from the edges. The whole was healed over in eight days, except for a small spot immediately about the urethra. The glands diminished in size in twenty-four to forty-eight hours, then decreased more slowly. SECONDARIES: Mucous patches showed the most rapid change; small ones had almost disappeared in twenty-four hours, larger ones took longer, but five or six days would see the end of even the largest. The angina behaved almost as well, though the tonsils sometimes remained large for several weeks, perhaps longer. Condylomata, one case, disappeared within a week.

Perhaps the most significant thing to be noted here is the fact that all these lesions were rich in spirochætes before injection, but at the end of twenty-four hours we were unable to find any spirochætes, except in one instance, where, after a long search, at the end of forty-eight hours, we found one dead one. Even after a few hours the movements of the spirochætes seemed slow and lifeless, in marked contrast to their former lively motions. In so far as the skin rashes were concerned the action seemed much slower. The roseola faded in forty-eight hours, sometimes becoming brownish in colour, and as such it persisted, in one instance, for three weeks. The larger squamous placques and papules also became brown, and very gradually disappeared, so that at the end of four weeks a thickening of the skin might still be noticed. The finer papules also persisted, in one instance, for about twenty days, but in all instances a definite, steady improvement was noted.

TERTIARIES. A serpiginous plantar syphilide, present for years and but little influenced by mercury or potassium iodide, became dryer within two days, though in five weeks the surface was still distinguishable from the rest of the skin by being slightly redder. Two deep ulcerating gummata of the palate and aleolar process with dead bone became healthy and had healed down to the bone in one week. The dead bone was loose and easily removed, and the mouth now shows but two shallow depressions. Two large ulcers of both legs, which had been long treated with potassium iodide and a mixed treatment, started to skin over within forty-eight hours, and within fourteen days were well. A case of bone syphilis, diagnosed as tuberculosis, on which account the patient had had his knee in plaster of Paris for eleven months and suffered so severely from night pains that he had come to Montreal to have the joint resected, lost his pains on the second night after the injection, and had no recurrence in the six weeks during which he was under observation. He walked home perfectly well, though the

skiagram showed no change in the bone. A case of cerebral lues, with marked ataxia and diplopia, due to paresis of the right external rectus muscle, steadily and surely improved till the diplopia had entirely disappeared, and the ataxia was markedly diminished. Pains of the nature of lightning pains disappeared also.

On the other hand, a case of cerebral syphilis with mental symptoms has shown no improvement in two months, and one case of secondary syphilis, which rapidly improved, developed several new mucous patches from which spirochætæ pallidæ were demonstrated two weeks after the injection of Blaschko's neutral suspension It is but fair to say that this patient irritated his mouth to an unusual degree by smoking cigarettes, but the fact remains that the spirochætæ pallidæ were not all killed, and a recurrence took place.

These instances will, perhaps, suffice. They are possibly the most impressive, but no more definite than the other cases. With the above exception, in no case, so far, have we had a failure. Not that we do not expect the latter, for since our first injection of November 3rd, there has scarcely been time for a final verdict. In so far as we have gone, we feel justified in saying that "606" acts on all the lesions of syphilis, that it acts more quickly than mercury or potassium iodide, and that it acts in cases where mercury fails. Whether it acts more surely or not, and whether its disadvantages are yet to appear, it is impossible for us to judge.

Wassermann Reaction. In so far as the Wassermann reaction is concerned, the period of observation of our cases is as yet too short to allow of any conclusions. This is perhaps true of all other observers. Lange[21], in Wechselmann's clinic, reports observations in 268 cases. In 135 of these, a positive reaction was changed to negative in the course of from four to five weeks. Of twenty-nine negative reactions, all remained negative. Schreiber and Hoppe[8] report that 92·3 per cent. of fifty-two cases observed for fifty or more days lost their previously positive reaction, the average in fourteen days, the earliest being four days and the latest seventy days. In our own cases, out of a total of twenty-six cases, three have become negative. More than this we cannot say.

Therapia Sterilisans Magna. As has been noted, it is possible to produce a strain of trypanosomes which resists arsenic, i.e. arsenic-fast strains. This is done by injecting small doses repeatedly, thus rendering the microörganisms immune, whereas a large dose would destroy them. Such a condition likely occurs in syphilis when mercury and arsenic are used. It was acting upon this knowledge that Ehrlich proposed his single large dose of "606," in order that all the spirochætes

XUM

might be destroyed at one blow, the so-called *therapia sterilisans magna*. The quantity of arsenic is much greater in "606" than in any other therapeutic compound of arsenic, viz, thirty-four per cent., further, the margin of safety, or difference between the therapeutic dose and the toxic dose, is great. In our cases, we have not used more than 0·6 g.m., though much higher doses have been given by other investigators. Judging from the literature and our one case, it is scarcely probable that Ehrlich has obtained his end. It is not in all cases possible to kill off all the spirochætes at once. While, therefore, we must still aim to reach this end, we must be prepared for recurrences, and prepared to carry out a chronic intermittent treatment. Schreiber[12], who has carried this out in some 650 cases, repeating the intravenous injection in six to eight weeks, has seen but one recurrence. Kromayer,[19] with a single dose, has had thirty-two per cent. of recurrences.

Untoward Manifestations. As far as these are concerned, it is necessary to remember that all arsenical compounds are poisonous, though in varying degrees, just as is mercury. Compare arsenious acid with sodium cacodylate, or atoxyl, which picks out the optic nerve, and dichlorphenyl-arsenic acid, which produces dancing mice (Hata[11]). With regard to "606," it is stated by those with the largest experience that toxic manifestations are rarer than with mercury. In so far as our cases go, we have to report, as the most immediate effect, a very definite amount of pain. Practically all our cases required morphia. The pain lasted variously, and appeared to depend largely upon the individuality of the patient. It was worse in women than in men. With the pain occurred a definite infiltration about the sites of injection, lasting for about three weeks. Even after this period, there was a sensation of soreness and weakness, whenever the gluteal muscles were put on the stretch. No case of necrosis has occurred. All cases showed a rise of temperature, falling bylysis. The average temperature was about 100°, the lowest being 99·4°, and the highest 104°. A certain loss of appetite was noted in all cases, and in one case, nausea, vomiting, and headache. The bowels have shown the usual constipation of bedridden patients. In three cases, as a result of being allowed out of bed too early, and too severe exercise, an increased absorption of the drug appeared to take place, as was manifested by an increase in temperature, pain, and general discomfort. In two cases this was accompanied by what, for want of a better term, we may call an arsenic exanthem. In one, a bright erysipeloid eruption over both buttocks and thighs, with a temperature of 104°, developed, the eruption lasting four days. In the other case, a bright, blotchy erythema, confluent over the buttocks and back, with a temperature

of 103° and lasting five days, was noted. The only other skin reaction we have noticed was a definite Jarisch-Herxheimer reaction two hours after injection, and lasting but a few hours in a case of roseola with fine papules.

Of the more remote effects that have been reported, such as jaundice and prolonged slowing of the pulse, we have no examples. Buschke[13] believes that there is a certain hypersensitiveness of the nervous system. McDonagh[14] reports a case of transitory albuminuria, Bohac and Sobotka[15] of retention of urine. Cases of local necrosis with sloughing of the skin have been reported by several, and, in all probability, some deaths are directly due to "606", though this is open to some question. No case of blindness has been reported, though unsubstantiated reports to this effect emanate from Paris.

Contra indications to the use of "606" are presented in diseases of metabolism, such as advanced diabetes, advanced cardiac disease or nephritis not of syphilitic origin, marked fundal changes, cerebral degeneration. To put it briefly, quoting Michælis[17], do not use "606" in cases where you would hesitate to give chloroform.

If we may draw a conclusion from a limited experience, it is this: "606" acts more quickly and more surely on the lesions of syphilis than either mercury or potassium iodide; it heals lesions where mercury and potassium iodide have failed; it destroys the spirochætes in a most dramatic manner. On the other hand its administration is painful and time consuming, and is a more serious matter than that of mercury or potassium iodide. With regard to the future it is idle to speculate. As yet we must be content to observe results. Judging from the work of others (7, 17, 19) we must expect recurrences in about one-third of our cases, and the question which appears most live to us, is whether we should not anticipate this recurrence by the administration of a second or third dose. In this connexion, it is not uninteresting to note that Neisser[16] repeats the injection in three to six weeks, and follows this with a course of mercury, the two remedies seeming to work together even better than separately. Michælis[17] advocates a repetition of the injection in all cases. Schreiber[12] has already carried this out in some 650 cases, in only one of which did a recurrence take place, and that in a case where the second injection was not given till after the recurrence. Kromayer[19] expresses himself frankly in favour of a chronic, intermittent treatment, by giving repeated injections of small doses (six doses of 0·2 gm.) within a period of twelve days. And lastly, Ehrlich[18] himself, in his latest word on this subject, recommended an intravenous injection of 0·4–0·5 gm. followed in forty-eight hours by an intramuscular injection, after the method of Kro-

XUM

mayer, of 0·3—0·4 gm., in order to supplement the more intense but fleeting action of the intravenous injection by the more prolonged but less intense one of the intramuscular deposit. Fortunately, so far, and in contradistinction to such drugs as arseno-phenylglycin, patients have not shown anaphylactic tendencies nor increasing sensitiveness to "606."

In conclusion, we do not wish to appear unduly enthusiastic. We fully recognize that mercury and potassium iodide have been powerful weapons in the treatment of syphilis, and that, on the whole, syphilis has been well treated. Nay, further, under certain circumstances, the action of either mercury or potassium iodide has seemed miraculous. In a word, we have not been altogether powerless against syphilis. But even if we must recede a little from the over enthusiasm which greeted the appearance of Ehrlich's new remedy, no drug, not even excepting calomel, has ever produced such immediate and consistent effects as "606" on the lesions of syphilis.

Bibliography:—


1. Ehrlich-Hata, *Die Experimentelle Chemotherapie der Spirillosen*, Berlin, 1910.
2. Todd and Campbell, *Montreal Medical Journal*, December, 1909.
3. Kromayer, *Berl. Klin. Woch.*, No. 37, 1910.
4. Alt, *Muench. Med. Woch.*, No. 11, 1910.
5. Wechselmann, *Berl. Klin. Woch.*, No. 27, 1910.
6. Michælis, *Berl. Klin. Woch.*, No. 30, 1910.
7. Stern, *Deutsch. Med. Woch.*, No. 49, 1910.
8. Schreiber and Hoppe, *Muench. Med. Woch.*, No. 27, 1910.
   Schreiber, *Muench. Med. Woch.*, No. 39, 1910.
9. Orth, *Deutsch. Med. Woch.*, No. 41, 1910.
10. Fischer and Hoppe, *Muench. Med. Woch.*, No. 29, 1910.
11. Margulies, *Deutsch. Med. Woch.*, No. 41, 1910.
12. Schreiber, quoted by Michælis, *Deutsch. Med. Woch.*, No. 49, 1910.
13. Buschke, quoted by Ehrlich, *Deutsch. Med. Woch.*, No. 41, 1910.
14. McDonagh, *Lancet*, Sept. 3, 1910.
15. Bohac and Sobotka, *Wien. Klin. Woch.*, No. 30, 1910.
16. Nessier, *Deutsch. Med. Woch.*, No. 41, 1910.
17. Michælis, *Deutsch. Med. Woch.*, No. 49, 1910.
18. Pick and Ehrlich, *Wien. Klin. Woch.*, No. 42, 1910.
19. Kromayer, *Deutsch. Med. Woch.*, No. 49, 1910.
20. Blaschko, *Berl. Klin. Woch.*, No. 35, 1910.
21. Lange, *Berl. Klin. Woch.*, No. 36, 1910.

# TUBERCULIN IN THE DIAGNOSIS OF TUBERCULOSIS

By J. C. Meakins, M.D.

*Assistant in Clinical Medicine, Royal Victoria Hospital; Demonstrator in Medicine, and Demonstrator in Pathology and Bacteriology, McGill University*

IN order to appreciate the faults and virtues of tuberculin in diagnosis, it is necessary to have a clear understanding of the cause of the reaction. When tuberculin is administered in large doses to man or animals free from tuberculosis no results are appreciable. On the other hand, the inoculation of a tuberculous animal with a very small dose of tuberculin will bring about marked and sometimes disastrous results. For example, 0.1. c.c. of tuberculin injected into a tuberculous guinea-pig will cause death in from twenty-four to forty-eight hours. In explanation of this it may be said that the guinea-pig, being an animal very susceptible to tuberculosis, has a marked specific hypersensibility to tuberculin. The tuberculin reaction, no matter how the tuberculin be administered, is due to the abnormal sensitiveness of the tissues to tuberculous products.

It has been known for some time that reactions may be obtained in infected individuals when the toxin from the organism causing the infection is introduced into the body. Von Pirquet exhaustively studied this phenomenon in revaccination for small-pox, and called particular attention to its significance. In tuberculin injections it has frequently been noted that in persons with tuberculosis there is a marked hyperæmia and swelling at the point of inoculation, even when the injection was made with the strictest aseptic precautions. This condition of hypersensitiveness, which is present in such persons, is an indication of an incomplete resistance on the part of the tissue cells of the body. The resistance does not produce complete immunity, so that when tuberculin is injected into an infected individual a specific resistance is manifested at the focus of the infection which is characterized by hyperæmia and local leucocytosis.

Varying with the extent of the tuberculous process in the body and the amount of absorption of tuberculous products, all the body cells become hypersensitive and resistant in varying degrees, or there follows a condition of acquired immunity associated with anaphylaxis. As a result, when tuberculin is injected subcutaneously, or applied locally to the skin or the conjunctiva, there is an attempt on the part of the cells, generally

or locally, as the case may be, to ward off the tuberculous material. Consequently, there is a reaction on the part of the cells, resulting in a systemic reaction or a local hyperæmia, and leucocytosis with exudation. If, however, the cells be non-resistant, or non-sensitized, the administration of tuberculin will produce no reaction. This latter condition is observed in acute miliary, and in advanced, tuberculosis. With these exceptions, nearly all cases of tuberculosis will give a reaction to tuberculin, if it be properly employed; and, furthermore, it may be confidently stated that a positive tuberculin reaction will never be found in a non-tuberculous patient, although the lesion may not be recognizable clinically.

In all the tuberculin reactions the Old Tuberculin of Koch or some modification is used. This tuberculin is obtained by growing tubercle bacilli in five per cent. glycerin bouillon for five weeks. At the end of this time the organisms are killed by exposure for an hour to a temperature of 100° C. The fluid is evaporated in vacuo to one-tenth of the original volume, and then the bacilli are removed by filtration through a Berkefeld filter. The filtrate is Old Tuberculin, and is supposed to contain the toxins which the tubercle bacilli have eliminated during their growth.

The tuberculin test originally recommended by Koch was the injection subcutaneously of a small amount of this tuberculin, and was the only method employed for some fifteen years. The cases in which this test is applicable are comparatively few, on account of certain limitations. It should not be used when a patient's temperature reaches 100° F. at any time of the day; nor should it ever be administered to patients with extensive physical signs of the disease, night sweats, great dyspnœa, recent hæmoptysis, meningitis, heart disease, or epilepsy, nor after acute diseases, and not for two or three weeks after a febrile attack of unknown cause.

The dose necessary to produce a reaction varies with different individuals. The first injection should not exceed one-half, better, one-fifth, of a milligramme. If no reaction occurs, the following doses should be given every third day: one, two, three, five, eight, and even ten milligrammes, and the last dose should be repeated. The method of administration and the careful observation of the patient before and after the injection are very important. For two days before the injection the patient's temperature should be taken every two hours, while awake, and recorded. The dose should be carefully prepared by the physician. For this purpose he should have a one c.c. pipette, graduated in tenths, a ten c.c. graduate, a flask of 0·25 per cent. phenol in normal saline, and four or five test tubes. The glassware should be sterile and plugged with sterile cotton. One-tenth c.c. of Old Tuberculin is added to ten c.c. of the phenol solution, making dilution "A." One c.c. of this contains one one-hundredth c.c. of

tuberculin. One-half c.c. of this dilution is further diluted with ten c.c. of the phenol, making dilution "B." One c.c. of "B" contains one two-thousandth c.c. or one-half of a milligramme of tuberculin, which is a safe initial dose for an adult. The tuberculin is injected with a hypodermic syringe, which has been boiled, and the needles sterilized in alcohol. The point of injection is optional, but the interscapular region is usually selected. The skin is sterilized with alcohol before and after the injection. As the reaction usually begins eight to twenty hours after the inoculation, the tuberculin should be given in the late afternoon or evening. On the day of the injection the patient should remain at rest, although not necessarily in bed. During the following two days he should remain in bed, and the temperature should be taken every two hours for three days afterwards.

If a reaction occur it may be general and local. The general reaction consists of malaise, headache, pains in the limbs, anorexia, and sometimes nausea and vomiting. Other symptoms of less importance, such as faintness, vertigo, insomnia, restlessness, and weakness, may occur. The elevation of the temperature is the most important symptom, varying from 100° to 107°F. It always occurs abruptly, and usually begins about twenty hours after the injection. A rise of temperature immediately after the inoculation, or a progressive temperature over several days, is not to be attributed to the tuberculin. A slight rise of temperature alone is not a conclusive reaction, but must have associated with it some of the general symptoms.

The local, or the organ, reaction, may occur at the point of the diseased focus. These changes are such as result from a hyperæmia of a tuberculous lesion. In the lungs there may be rough breath sounds, crepitations, and, possibly, a slightly higher percussion note. In tuberculosis of the glands, joints, or the larynx, increased swelling and redness may result. In some cases unsuspected tuberculous disease may be discovered in the joints, bones, glands, bladder, or kidneys, as a result of this local reaction. The amount of discharge from the tuberculous focus may be increased, and there may be a greater amount of sputum, or an increase in the pus and blood in the urine, with the presence of tubercle bacilli for the first time. In many cases a reaction occurs at the point of injection. This is characterized by swelling, redness and tenderness. In order, however, that a reaction may be considered positive, there must be an abrupt rise of temperature to 100°F., or over, with a more or less pronounced general reaction.

For fifteen years the subcutaneous method was the only means known whereby tuberculin could be used for diagnosis. In 1906, Wolff-Eisner, and Calmette simultaneously published their conjunctival

XUM

reaction. The former used a one per cent. solution of Old Tuberculin in normal saline, while Calmette advised the use of a purified Old Tuberculin, on account of the glycerin present being an irritant. The glycerin is removed by precipitating the Old Tuberculin with sixty-five per cent. alcohol, filtering, washing the residue with alcohol, and then drying. By this method a brownish powder is obtained. Before use, it is freshly dissolved in sterile saline in a one-half per cent. solution.

The inoculation is performed by dropping twenty-five one-thousandths of a cubic centimetre of a one-half per cent. solution into the conjunctival sac. In positive cases the reaction usually begins after from three to six hours. There is a hyperæmia of the conjunctiva of the lower lid, the caruncle, and the bulbar conjunctiva, with slight swelling, followed by an injection of the vessels and increased secretion. The intensity of the reaction may vary greatly, from a mild hyperæmia, lasting a few days, to a most intense inflammation of the conjunctiva, cornea, and lids, which may last for weeks. The inoculation is best given in the evening, in order that the reaction may be observed during the daytime. If the first test be negative, after forty-eight hours a second may be made in the other eye with one per cent. tuberculin. A conjunctiva once tested cannot with safety again be subjected to tuberculin, owing to the possibility of a very severe reaction after such repetition. This reaction is dependent upon the normal susceptibility of the cells of the conjunctiva to all irritants, and particularly to tuberculin in tuberculous subjects. The reaction may be very violent, leading to phlyctenular conjunctivitis, keratitis, conjunctivitis lymphatica, long continued conjunctival catarrh, and pannus scrofulosus. It is contraindicated in any inflammatory or hyperæmic condition of the eye or conjunctiva. Owing to the unpleasant results and contraindications this test has fallen universally into disuse.

About the same time that the Calmette ophthalmic reaction was first used, Von Pirquet published his results of the cutaneous tuberculin test in children. His attention was first directed to the possibility of this reaction by the effect of revaccination for small-pox, in which a much more violent reaction occured than was expected. He studied the problem of anaphylaxis very carefully, and applied his researches to the diagnosis of tuberculosis by a local reaction. According to the theory of anaphylaxis, the cells of the skin of tuberculous persons should be hypersensitive to tuberculin, and this is found to be the case.

In the Von Pirquet, or cutaneous, reaction, a strong solution of Old Tuberculin is employed. Some workers use the pure tuberculin, while others prefer to use a twenty-five or fifty per cent. solution in normal saline. I have found the fifty per cent. solution to be very satis-

factory. This is prepared by mixing equal parts of Old Tuberculin with 0.25 per cent. phenol in physiological saline solution. One c.c. of this mixture may be prepared at one time, and will keep in a tightly stoppered bottle for an indefinite period free from contamination. As a control, fifty per cent. glycerin in 0.25 per cent. phenol bouillon should be used.

The method of application is as follows: The skin, preferably on the flexor surface of the forearm, should be sterilized with alcohol and thoroughly dried. A small drop of the tuberculin solution is applied, and then, with a needle or a lancet, a slight abrasion of the skin is made under the drop. Only the most superficial layers of the epithelium should be removed, and it is very undesirable to draw blood. At a distance of about one inch, a drop of the control solution is placed, and a similar abrasion made. The arm should be left uncovered and free from contact until these spots have completely dried, thus indicating the absorption of the solution. This will take, in all cases, at least half an hour, and in many cases much longer. The scarification may be performed with a variety of instruments. The most commonly used are: a needle, a vaccination lancet, a Von Pirquet scratcher, or a dental burr. Personally, I prefer either a dental burr, or the Von Pirquet scratcher.

The reaction should begin to appear in from ten to eighteen hours. The characteristics are, a hyperæmic zone, at least one c.m. in diameter, with a button of œdema, and marked papulation of the skin. In some cases, vesicles may appear, and even the exudate of a serous fluid. The reaction begins to fade in about forty-eight hours, but is quite distinct for many days. About the point of the control scarification no reaction is shown. This test is extremely delicate, and often occurs in patients who appear to be practically free from tuberculosis. In this regard it is like all other tuberculin reactions. However, there are no contraindications to the Von Pirquet test, and it has the advantages of producing no general reaction, of being free of local danger, and of being applicable to febrile cases of tuberculosis.

Another cutaneous test, very similar to the Von Pirquet reaction, is the Moro inunction reaction. In this test an ointment is made of anhydrous lanolin and Old Tuberculin, equal parts. An area of skin on the abdomen, two to three inches in diameter, is sterilized with alcohol. About one-tenth of a gramme of this ointment, or a piece the size of a split pea, is rubbed into the skin for about a minute. The finger of the person applying the ointment should be protected by a rubber finger cot, and particular care should be observed that there is no previous eruption near the point of application. This area should

XUM

be protected by a raised shield. Adhesive plaster should not be applied over the point of inunction, as this may give a false reaction.

The reaction varies greatly in extent. Over the area of the inunction there appear, after twenty-four to forty-eight hours, discrete red papules, varying in number from two to hundreds, and in diameter from two to thirty mm. These are surrounded by a slight zone of hyperæmia, which, however, may be very intense, becoming confluent and giving rise to a dermatitis, with severe itching. The reaction may remain for a period varying from a few hours to many days. An intense reaction, with great discomfort, occurs in about eight per cent. of cases. This naturally depends somewhat on the sensitiveness of the skin. The test is very specific, and, in cases controlled by other tuberculin reactions, is found to be very reliable. It has the advantage of producing fewer reactions in clinically tuberculosis-free individuals than the Von Pirquet. It has, however, the disadvantage of producing, at times, severe local reactions which are very distressing to the patient, and sometimes pseudo-reactions occur due to the inadvisable use of adhesive plaster as a protection.

Another cutaneous tuberculin test is the intra-dermal. This is performed by the injection of a measured amount of tuberculin into the thickness of the skin. The advantages of this procedure over the ordinary Von Pirquet and Moro reactions is that it is possible to determine with more accuracy the amount of tuberculin absorbed. The amount of tuberculin injected is usually 0·01 mg. A fold of the skin is pinched up, and the hypodermic needle passed through parallel to the surface with the opening of the needle outwards. Care should be taken that the point of the needle is not under, but in, the skin. This takes some practice, and great care must be employed to attain this result. If one fails, then, practically, a subcutaneous test is performed.

The reaction, when positive, is extremely delicate. It appears, at the end of several hours, in the form of an infiltration, perceptible by the touch, or shown by a white or pink colour. At the end of twenty-four hours the infiltration has increased markedly; the spot is a deep pink or red, or, perhaps, white with œdema, with a slightly mottled surface. Around it appears a halo of erythema. At the end of forty-eight hours the reaction has reached its height, and the central lump and the surrounding erythema are still more developed. The size of the infiltrated area is usually one-half cm. in diameter, though it sometimes widens to four-fifths cm. In rare instances, with the surrounding erythema, it may be the size of the palm of the hand. At this time the skin is hot and somewhat tender to pressure. The reaction fades

away the second day, the halo disappears quickly, the lump takes on a violet or yellowish colour, and is slowly absorbed. It may still be visible at the end of several weeks. A constitutional reaction is generally absent, but may sometimes occur.

When the reaction is negative, there may sometimes be noticed at the site of the injection a slight congestion, and a very slight induration, but these phenomena have always disappeared before the end of the second day. It is, therefore, very easy to distinguish them from a true, positive reaction. While the intra-dermal reaction is very sensitive, and produces reactions in clinically tuberculous-free patients, it does not react in the moribund cases. The only advantage this reaction has over the Von Pirquet or Moro reaction is the ability to inject a definite quantity of tuberculin, while the disadvantages are the difficulties of the technique, the necessity of a hypodermic syringe, and the dangers of a general reaction.

There is still another tuberculin test which differs from any of the above in that the reaction is not produced in the patient but in another animal. In 1909, Yammanuchi described this test, which depends solely on the principle of anaphylaxis. The procedure for the test is as follows: Five c.c. of blood are removed from the patient suspected of tuberculosis. This blood is received into five c.c. of two per cent. sodium citrate in normal saline solution. The whole ten c.c. are then injected into the peritoneal cavity of a rabbit. After twenty-four hours, three c.c. of Old Tuberculin are injected into the general circulation of the rabbit by the ear vein. If the reaction is positive, the phenomenon of anaphylaxis develops rapidly. The rabbit becomes very dyspnœic, shows extreme distress, and, developing general convulsions, dies in a few minutes.

The explanation of this test rests solely on the production of a hypersusceptibility by the injection of the patient's blood. In order that this should occur, it is necessary that there be circulating in the patient's blood tuberculous products, which render the cells of the rabbit hypersensitive to the injection of tuberculin. The test is a very sensitive one, and gives strong proof that there are tuberculous bodies present in the blood of patients with very slight signs of tuberculosis. There are a few cases in which a positive reaction may be obtained by means of this test that would be of great value. I have had four such cases. They were two cases of acute miliary tuberculosis, one of spinal caries, and one of advanced abdominal tuberculosis. All these cases were atypical and the diagnosis was very doubtful. The Von Pirquet reaction had been negative in all, but the Yammanuchi test was positive. Subsequent events proved the diagnosis of tuberculosis to be correct.

XUM

The use of this test is limited, both on account of the character of the cases to which it is applicable, and also on account of the facilities necessary to perform it.

Of the six tuberculin reactions described above, there are three which are of prime importance. These are, the subcutaneous injection, the Von Pirquet test, and the Moro; or, as they may be divided, the systemic reaction, and the local reaction. Many clinicians have no faith in these tuberculin reactions, because, in unskilled hands, the test only diagnoses the presence of tuberculosis, and does not indicate the site of the lesion, the degree of the infection, and the treatment required. This may seem a broad statement, but yet it is the unconscious attitude assumed by many men. In the hands of skilled and experienced workers, all these points may be determined in many cases. It may be well at this time to give a short sketch of how these results may be obtained.

The first point to be considered is the general diagnosis of tuberculosis. This may be accomplished by any of these reactions. But, for reasons stated above, either the Von Pirquet or the Moro test is to be preferred. If either of these tests be positive, it is absolute proof of the presence of tuberculosis somewhere in the body. It is a much more difficult matter to locate the site of the lesion. The only reaction applicable for such a purpose is the subcutaneous test. Besides the contraindications specified above, the tuberculous lesion must be in a situation where it may be observed, as, the lungs, glands, skin, larynx, bones, kidneys, bladder, testicles, etc. In a positive subcutaneous reaction, due to lesions of these organs, definite local changes occur which will localize the lesion, but if such an organ reaction does not occur, and there are the other signs of a positive test, the presumption is strong that the infection is elsewhere.

The degree of the infection is best judged by the cutaneous reactions. It is a safe working rule that the more violent the reaction, the greater the resistance of the cells of the body, and the less severe the infection. In determining the dose of tuberculin for therapeutic use, there must necessarily be some standard of comparison, and this will be dependent upon the amount of tuberculin employed. For this reason, the Von Pirquet, or the intra-dermal, test is the best, as the amount of the tuberculin applied can be accurately determined. In the Von Pirquet test, various percentages of tuberculin are used, 10, 25, 50 and 100, and of these a definite quantity, as, 0·01 c.c. A series of inoculations may be made, applying the various quantities in separate places, each protected by a vaccine shield to allow as complete absorption as possible. This part of the procedure is very important; as (1) the tuberculin remains moist on the skin for a number of hours, and would otherwise be par-

tially rubbed off by the clothing; and (2) it is the quantity of tuberculin absorbed that determines the reaction. By means of this test it is possible to find the least amount of tuberculin which, when applied to the skin as described, will produce the minimal cutaneous reaction for each patient; i.e., a local redness about four mm. in diameter.

From the study of a number of cases, it has been possible to determine a definite ratio between the amount of tuberculin applied cutaneously and that given subcutaneously for the production of local and constitutional reactions. One-fifteenth of the amount of Old Tuberculin, which, when applied to the skin, produces the minimal cutaneous reaction, will produce, when given subcutaneously, both local and constitutional reactions; one-thirtieth of the same amount, subcutaneously, will produce local without constitutional reaction, and one-fiftieth of the minimal cutaneous reaction dose will produce neither local nor constitutional reactions when given subcutaneously. It is possible to determine, therefore, first, the borderland of reaction and no reaction to tuberculin, which will be the degree of tolerance of the patient to tuberculin; and second, the dose of tuberculin necessary to give the grade of reaction required.

It has been stated above that the local reactions, conjuctival, cutaneous, inunction, and intra-dermal, frequently give a reaction when the patient is clinically free from tuberculosis. On this fact rests one of the most important uses of the local tuberculin reaction. This test is more valuable for the exclusion of tuberculous infection than for the diagnosis of clinical tuberculosis. As about seventy per cent. of all adults have had a tuberculous focus, and as the frequency of this infection increases from infancy to old age, the chief usefulness of the test is in young people. However, owing to the extreme delicacy of the reaction, it is of value in all cases where it is desirable to exclude the possibility of tuberculosis. If the reaction is positive, the patient is not necessarily suffering from clinical tuberculosis, although it may be of value in conjunction with other signs. On the other hand, the absence of a cutaneous reaction is strong presumptive evidence that the patient is free from a tuberculous lesion.

XUM

# FOOD STANDARDS

By A. McGill, M.A., LL.D.

*Director of the Laboratory of the Inland Revenue Department*

FROM some points of view, it seems rather surprising that the proposal to enact legal definition and standards of quality for foods and drugs should create any anxiety, or awaken anything more than academic interest. Among a people perfectly informed, and perfectly honest, the proposal could have no more meaning than the construction of a dictionary of technical terms; it would not affect business in any way. In such a state it could only be through accident that substitution of one article for another might occur. Government surveillance would not be needed; and expert supervision would only be required by the manufacturer as a guide in production. Of course all this is Utopian, and can only be realized in a future when we shall need neither military nor police forces.

The recognition of human frailty, and the temptation offered by our adoption of the prevailing business principle, buy in the cheapest market and sell in the dearest, compels the buyer to seek protection by legal means. For, while it is true that ignorance on the part of those who supply the market may, at times, unwittingly endanger the health and the pocket of the consumer, it is abundantly evident that, in the main, it is not ignorance which supplies the sophisticated food and drug products that flood our markets to-day. On the contrary, a very high degree of technical and special knowledge is possessed by, or is at the service of, the producer. The discoveries and advances of physics and chemistry are capable of being employed alike in the interest of honesty and of dishonesty. Science itself is neither moral nor immoral; it is simply unmoral.

The legalizing of standards and limits of variability for foods and drugs, and the enforcement of such standards by penalty, is nothing more than an attempt by the consumer, that is, by the body of the people, to ensure honest dealing, and by honest manufacturers to prevent dishonest and unfair competition. The buyer seeks assurance that what he pays for shall actually be what it is represented to be, and the honest producer seeks to prevent competition with surrogate wares offered as genuine.

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Address delivered before the Society of Chemical Industry, December 2nd, 1910.

It must not be supposed that I make the term "honest producer" synonymous with the producer of highest grade goods. The manufacture and sale of goods of inferior quality may be strictly honest and be a great boon to the community. But this is conditioned upon their being offered for what they truly are. It may remind you that in at least two articles of food, butter and honey, our Canadian laws forbid the manufacture or sale of substitutes, even where these are offered under perfectly distinctive names. I regard modern butter substitutes and imitation honey, when properly made, as desirable foods, and entirely justifiable additions to the nation's commissariat. Our Butter Act, and Section 30 of the Adulteration Act, are, I believe, merely the evidences of that human characteristic, so often manifest in man's history, and given voice in the couplet:

"Let him take who has the power,
And let him keep who can."

First in importance comes the matter of names. In order to ask for a thing, we must give it a name. It is notorious that many of the ordinary names of commerce are used with different and varying significations. Such words as milk, sugar, flour, salt, suggest themselves in illustration. Milk may mean the lacteal secretion of any mammal; but to us, it means cow's milk. Sugar, which to the chemist may stand for sucrose, dextrose, levulose, lactose, maltose, etc., is restricted in commerce to the first named. Flour, means wheat flour; salt, means chloride of sodium, in everyday parlance. In other cases it is very difficult to say exactly what is to be understood by words in daily use. We have examples of this difficulty in the words, whiskey, vinegar, sausage, etc., and much wit and money have been expended in attempting to define these terms. As it is not the business of the lexicographer to give meanings to words, but simply to record and register the meaning which they have acquired in customary use, so it is no part of the legislator's duty to find names, but merely to recognize their accepted meanings. What does the buyer really want when he asks for sausages? It will generally be granted that sausage-casing is a part of the article "sausage," but is this to be filled with chopped pork, or beef, or bread-crumbs, or oatmeal, or a mixture of two or more of these? Is the use of a dye or a preservative forbidden? How much water may the sausage carry? What about the character of the spices used? I suppose the average buyer could do no better than to say, "I mean the thing that my mother and grandmother used to call sausage: the same thing that I knew as sausage when a boy." Here we are at once confronted with the problem of improvement in manufacture. The

XUM

milk supply of towns is, without doubt, an improvement, at least in point of cleanliness, upon the milk of twenty years ago. Butter, made by modern methods, is a very superior article as compared with the butter of that time.

Inspection of bakeries, of packing houses, and of many other industries, has undoubtedly improved the quality of the output. Why may not the sausage of to-day be a much better article than that of our boyhood? This consideration opens a field of research that I must not further explore just now. In many cases, perhaps in most cases, it will be found that the use of an unmodified name-word leaves the matter so vague that even the honest vendor is at a loss what to do to meet the wishes of his customer. He may be led to ask, "Do you want pork or beef sausage? Do you want Cambridge sausage or black pudding?" Many a purchaser of coffee has been dissatisfied because the article supplied him contained no chicory, although he did not mention chicory in asking for coffee, and the dealer would have laid himself open to a fine had he supplied chicoried coffee without declaration. Although the terminology of food has grown up without any preconceived plan or system of notation, it will be found that the language of commerce admits of a more or less perfect systematization. We have large classes of foods, just as we have orders in botany. These may be grouped under such well understood and popular headings as, breads, meats, flours, milks, wines, spices, pickles, etc. Although it often happens that the class name, used by itself, has come to stand for a particular genus or species, this is no more remarkable or surprising than that a particular book or bible, among all books or bibles, should have taken to itself the wider term, in a special sense. Among many kinds of bread, a particular species is well understood as bread; so of meat, of flour, of milk, etc. In consequence of the main fact, it will not only be convenient but conducive to clearness, if we proceed to define foodstuffs conformably to the classification refered to. Before, however, continuing this aspect of the subject, I should like to refer to one or two popular mistakes as to the meaning and effect of standardizing foods. One rather sweeping interpretation of the effect of government standardizing was evidenced by a claim, received a few days ago, for the value of a suit of clothes spoiled by the explosion of a bottle of ketchup which had undergone fermentation. Why should the government allow such a thing to be sold? This is rather a terrifying view of the matter for those in authority. Another unjustifiable application is the belief that prices will be more or less controlled, and the purchaser assured of getting his money's worth.

The market value, or price, of an article is dependent upon many

other considerations than the fact of its being true to name. Confining ourselves to the case of food-stuffs, the main controlling element of market value is, of course, the ratio of demand and supply. But demand is a very complex factor. It is partly influenced by considerations of nutritive or of condimental value; but fashion, prejudice, and the influence of advertising are far from negligible elements in it. The standardization of foods has so little influence upon the prices at which they are sold as to be a negligible factor in fixing price. Foods are sold for what they profess to be, not necessarily for what they are.

Concerning advertising, just a few words. We can imagine the manufacturer of a food or drug to be honestly convinced of the supreme value of his product to humanity. Perhaps he has a gluten flour or bread. He has used it himself, believing himself to be a diabetic subject, and thought that he received benefit from it. His friends have used it, apparently with good effect; and being fully convinced of its merit, he advertises it as a sure cure for diabetes. If he secures the confidence of a suffering public, it goes without saying that he finds ready sale for his product at almost any price he may please to fix. But a careful investigation of the article, in the light of unprejudiced and expert knowledge, may compel us to recognize the essential falsity of his claim. The case, however, is not one of intentional fraud, and it is only in a technical sense that the article can be described as adulterated. It is open to question whether the stigma attached by popular consent to this term would not justify the employment of another word for cases of the kind.

The United States Pure Food Law distinguishes between adulteration and misbranding; and I am inclined to think that the distinction is a sound one. While misbranding may be, as in the case supposed, without intent to deceive, it may, nevertheless, effect deception of a most serious nature. It is not difficult to imagine what a vogue may be obtained for a nostrum represented to be an unfailing remedy for this, that, or the other disease. The afflicted are likely to regard as of small moment the price of the panacea, if only the claims set forth win their belief in its virtue. Here there is a field where the unscrupulous promoter may reap an immense harvest. Under our own Adulteration Act, nine different conditions of adulteration are enumerated (Sec. 3, a—i): (a) admixture to reduce quality or strength; (b) substitution of inferior or cheaper substance, wholly, or in part; (c) abstraction of valuable constituent, wholly, or in part; (d) imitation of, or sold under the name of, another article; (e) if diseased or putrid; (f) if containing poisonous ingredients; (g) if

XUM

below legal standard; (h) if coloured or coated to conceal damage; (i) if milk or butter from diseased animal.

It is evident that the intent to defraud is involved in every one of these conditions, unless possibly divisions (f) and (g). It is conceivable that poisonous matters may be present, or that the article may be below the legal standard of quality, without the knowledge of the vendor. I have already referred to the case of a medicine offered as a panacea for specific diseases, and possibly in good faith, although entirely valueless. Such cases should, perhaps, be distinguished as misbranding, rather than as adulteration. If usage and custom fix the meaning of language, how are we to ascertain the exact meaning of ordinary terms, and make it possible to use them with precision? Exactness in meaning is far from being a characteristic of everyday speech; and every country that has gone about the fixing of food standards has found it necessary to take this fact into account. Producers, handlers, and consumers have been given hearings; and the evidence taken before commissions would fill a library. Parliamentary committees in England have taken up, at different times, the questions of milk and its products, cocoa, coffee, mustard, etc., British and foreign spirits, cattle feeds, and preservatives and colouring matters in food. In Germany very numerous sessions of the Bunde Deutscher Nahrungemittel-Fabrikanter und Handler have discussed food matters, and their latest deliberations are summarized in the Deutsches Eahrungsmittelbuch, second edition, published at Heidelberg last year. In France, the work of the *Societé Universelle de la Croix Blanche* is specially worthy of mention. The last congress under its auspices was held at Vienna. Its proceedings are not yet available, but I am able to place before you proceedings of the congress held at Paris, in October, 1909. These form a volume of nearly fifteen hundred quarto pages, and prove the assiduity and earnestness with which this phase of the subject has been prosecuted. The work done in the United States in this direction is so voluminous that it forms a perfect treasure-house of knowledge upon the conditions of production and sale of every manner of food-stuff.

We, in Canada, are fortunate in having such rich resources to draw upon. Nevertheless, it is necessary for us to keep in view the fact that our own country presents certain conditions of a kind which must be fully considered before we decide upon national standards. I might illustrate this point by reference to many products which take their origin under quite different conditions from those obtaining elsewhere. Take the case of wine. Just as the wines of some parts of France differ from those of other districts, and these from the wines

of Spain, Italy, and Austria, so our Canadian wines possess a character of their own, and the interests of the industry require that standards for Canadian wines should have regard to climatic and other conditions found in Canada.

An Advisory Board was appointed last year whose duty it is to advise the Department of Inland Revenue. Standards have thus far been framed for foods coming under the following class headings: milk and milk products; meat and meat products; grain and grain products; beverages, non-alcoholic and alcoholic. Legal force is given to these standards by Order-in-Council and publication in the *Canada Gazette*, as provided by Section 26 of the Adulteration Act.

It will easily be understood that we have, thus far, merely touched the outskirts of the vast subject to be dealt with; which includes not only foods and drugs for the use of man, but also foods and drugs for domestic animals. To attempt here, any detailed study of individual foods would be quite beyond the purpose and scope of this article, and I shall merely ask consideration of one or two points which are of special moment. If we divide foods broadly into unmanufactured and manufactured, meaning by the first such articles as are sold pretty much as nature provides them, e. g., vegetables, fruit, milk, meats, etc., and by the second such as involve more or less complex processes, e. g., preserves, cheese, butter, flour, bread, etc., it will be found, I think, that our troubles begin with the second class. It is true that nature is far from constant in regard to the quality of her productions; thus, potatoes from the same field, apples from the same tree, and even milk from the same cow, and *a fortiori* from different cows, may vary much in quality. But the differences are nearly always such as to be perfectly recognizable to the ordinary buyer. Observation of the most superficial kind is usually enough to tell us whether meat is sound or decayed; whether fruit or vegetables are sound or rotten; and whether milk has been skimmed or not. It is when we come to the class of manufactured foods that real difficulty begins.

In certain curious and interesting ways, the influence of man may be evident even in the first-named class. Thus, the mixed milk of a herd of cows will seldom contain less than between three and four per cent. of fat; but if we carefully select such animals as yield quantity at the expense of quality, we may artificially produce a herd whose milk will be very low in fat. This is truly a case of manufacture, resulting in an average which nature, left to herself, would never have produced.

The above named distinction between natural and artificial products is broadly recognized in the Feeding Stuffs Act and in the Fertilizers

Act, both passed last year. The terms "feeding stuffs" and "fertilizers," respectively, are so defined as to exclude naturally produced feeds and fertilizers or such as have been subjected to very simple manufacturing processes. Thus, hay, straw, whole grains, etc., and barn-yard manure, are exempted from inspection. The purchaser is supposed to be able to judge of their value without expert assistance.

So far as drugs are concerned, we are fortunate in having the British Pharmacopœia, as well as other pharmacopœias, recognized as fixing standards. It happens, in some cases, that the same article is employed both as a food-stuff and as a drug. This is true of alcohol, acetic acid, many essential oils, bi-carbonate of soda, tartaric acid, cream of tartar, olive oil, capsicum, cloves, and others. The question here arises: Is it proper or necessary that the same standard should be legalized for the article as a food which is fixed by the pharmacopœias for the article considered as a drug? The bearing of this aspect will be seen if we study the case of cream of tartar. The article, as defined by the pharmacopœia, is not strictly cream of tartar, but purified cream of tartar, in revisions later than 1885. It is to contain at least ninety-seven per cent. of bi-tartrate of potash. It is quite true that much of the cream of tartar sold for baking purposes reaches this standard of purity and strength; but, if directly ground from the refined crystals obtainable in the large wine producing countries of Europe, it usually contains only about ninety per cent. bi-tartrate. The impurities are normally small amounts of sulphate and tartrate of lime, and cannot be said to have any harmful effects upon health, although their presence certainly reduces, to that extent, the value of the article in baking. Is it necessary to forbid the sale of such an article, properly labelled?

Another matter, which is left for special study, is the question of chemical preservatives in foods. This has, perhaps, awakened a wider interest than any other aspect of food definition; and has called forth such a mass of evidence, both experimental and professional, as to make it very difficult to grasp in all its bearings. It will receive very careful consideration at the hands of the Advisory Board. I am acutely sensible of the imperfections of my presentation of this subject, and must plead its vast scope for leaving so large areas of it untouched.

# THE INFLAMMATORY "PELVIC MASS"

By W. W. Chipman, M.D., F.R.C.S.E.

*Professor of Gynæcology in McGill University; Assistant Gynæcologist to the Royal Victoria Hospital, Montreal*

THE genital tract in the female—the vagina, uterus, and Fallopian tubes—may be considered as a cylinder, bifurcate in its upper portion, interposed between the external body surface and the peritoneal cavity. This bifid cylinder is patent throughout its length, and its upper extremities, the abdominal ostia of the tubes, are as open and unprotected as is the vulvar introitus below; throughout its course there is no obstacle, or even impediment, to any reciprocity between the external skin surface and the great mesothelial lymph space. Bacteria of all kinds, pathogenic or non-pathogenic, may track anywhere throughout its length, and through it find easy entrance to their great hunting-ground, the peritoneal cavity. Exposed so above and below, swung between unyielding bony walls, packed about with little resistant cellular tissue, and richly supplied with absorbent lymphatics, this genital cylinder undergoes always the periodic stress of menstruation, endures at times the strain of pregnancy and labour, and suffers the various traumata of child-birth or abortion. Gonorrhœal or pyogenic infection attack it not uncommonly from below, and tuberculosis from above. In consequence, viewed both from its anatomical disposition, and its many physiological vicissitudes, it, of necessity almost, is frequently (too frequent it is true), the channel of ingress of acute peritoneal and systemic infection, and is itself very often the seat of local injury and disease.

It is solely with the local inflammatory disease of this genital cylinder that this paper proposes to deal; and only as this disease manifests itself in the upper portion of this cylinder, the portion above the pelvic floor—the uterus with its intra-ligamentous cellular tissue, the parametrium, and the Fallopian tubes. To these structures must be added the ovaries; for these latter organs, resistant as they are to infection usually, become involved in the inflammatory process by reason of their close apposition and lymphatic supply. We speak, then, of inflammations of the uterus, its adnexa, and the pelvic cellular

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XUM

tissue, for it is any or all of these structures, when involved in an inflammatory process, which come to constitute the inflammatory "pelvic mass." In particular terms the inflammatory "pelvic mass" is a metritis, a salpingo-ovaritis, or a cellulitis, single or combined, unilateral or bilateral, together with the attendant intraperitoneal adhesions and exudate. All degrees of the process occur, from the unilateral small deposit, either cellulitic or tubo-ovarian, to the complete so-called "choked pelvis," where the viscera are no longer discrete or discernible and the pelvis appears as run full of plaster-of-Paris, occupied to the uttermost by a single, firm, undifferentiated mass. No matter the gradation of this process, the lesion constitutes itself as the inflammatory "mass." It is of the ætiology of this "mass," its varieties, life history, and treatment, that I propose to speak.

Even as the poor, the inflammatory "mass" in the pelvis is always with us. It is extremely common, and a right understanding of its ætiology, its exact recognition or diagnosis, and the wise method of treatment come to constitute no small part of the special knowledge of the abdomino-pelvic surgeon. Since the opening of the Royal Victoria Hospital in 1894, 4,200 cases have been treated to a conclusion in the department of gynæcology. Of this number, 832, roughly one-fifth of the total, have been instances of inflammatory disease of the uterus and its adnexa. This, I think, represents fairly the experience of every gynæcologist, that about one-fifth of his practice is concerned with inflammatory lesions of these viscera.

Moreover, since there is no boundary or dividing wall between the pelvis and the abdomen, inflammatory disease in the former may, and often does, invade the latter. In such way the whole lower abdomen, and even the flanks, may become involved.

The mechanism of this extension or spread is the formation of the reactionary zone, lymph adhesions and exudate, thrown out to oppose the infective process. All viscera are levied into the service so as to form a retaining wall. If the initial focus be parametrial the main spread is always extraperitoneal, and the conflict is marked by the induration zone of cellular tissue. While if the lesion be visceral from the first, the struggle is chiefly waged within the peritoneum. The various viscera, first of the pelvis and then of the abdomen, become matted together. The omentum, the great peace-maker, is, as usual, quickly involved, and one after the other the successive coils of intestine. So the process extends, often at intervals quiescent, only to break forth anew; and its ultimate size is measured solely by two things—the extent and virulence of the infection and the individual's comparative resistance. So it varies from the small hen's egg mass, unilateral

and entirely pelvic, to the large abdominal tumour. Though constituted in this way, when slow of formation its periphery may become so sharp and distinct, its whole contour so well defined, that it not infrequently simulates a broad ligament or ovarian cyst.

Instances of diffuse spreading peritonitis with little or no local reaction or "walling off," which occasionally arise in the pelvis, are, of course, not included here; they give rise to no local mass.

As I have said, the inflammatory "pelvic mass" is primarily either within or without the peritoneum, the site depending largely upon the nature of the infection.

Within the mass itself any stage of the inflammatory process may be discovered. Frequently it is only the initial stage of lymph exudate and œdema with round cell infiltration, as seen in the catarrhal salpingo-ovaritis, hydrosalpinx or cellulitic deposit. All stages of necrobiosis and tissue necrosis occur, and not infrequently there obtains surgical pus—the pyosalpinx, the tubo-ovarian or ovarian abscess or the extra-peritoneal focus. Concerning the presence of pus, the temperature chart is human, and is therefore not infallible.

Such then is the actual entity, the inflammatory "pelvic mass." I shall now deal very shortly with its ætiology and the clinical features of its three chief varieties, treating the subject as in the article published n the August number of the *Journal of Obstetrics and Gynæcology of the British Empire.*

Any systematic knowledge of inflammatory lesions in the pelvis goes back only some thirty years. Noeggerath's paper was published in 1872, but it was not until 1879 that Neisser isolated the gonococcus. Hegar's monograph on genital tuberculosis appeared in 1886, and though Döderlein published his classical paper in 1892, any exact information in regard to pyogenic infection of the pelvis practically begins with the present century. Only during the past dozen years have the flora of the healthy genital tract been described and classified. Numerous and exhaustive studies have recently been made, and the aggregate result is as follows: Pathogenic organisms are frequently present in the lower segment of the genital tract. From the healthy vagina of pregnant women the streptococcus pyogenes, the staphylococcus, numerous diplococci, including the gonococcus and the bacillus coli communis, have been repeatedly recovered. While in every sense objectionable aliens, these organisms do not of necessity occasion disease, for the resistance of the healthy mucosa is great. They are, of course, in the parturient canal specially dangerous. When pathogenic they produce, each in its own way, the general and localized infections with which we are unfortunately so familiar. Such local infection is in-

XUM

variably the cause of the "pelvic mass," for from the "mass" itself these same organisms can very often be recovered and cultivated. Not always so, it is true, as some, particularly the gonococcus, perish rapidly in their own toxins. The rule of their presence obtains, and their several varieties, their different behaviour, the methods of infection, the choice of the tissues and the resulting lesions—in a word, their pathogenic life history has been, and still is, the subject of study. In this connexion should be remembered always the researches of Menge, Kronig, and Stoltz, and in our own country the work of Andrews, Hyde, Williams, MacDonald, and Little.

Much remains to be done, but from our present day knowledge the following practical points may be gathered: The organisms that are chiefly pathogenic in the female genital tract are three, or they fall into three groups, Neisser's gonococcus, the streptococcus in its several varieties, and the tubercle bacillus. The staphylococcus aureus, the bacillus coli, and the pneumococcus, which are comparatively seldom found, and then usually in mixed infections, and the various saprophytes, which are relatively unimportant, may be for the time disregarded. I also shall not speak of the singular infections from bowel or blood-stream frequently found in senile conditions. There remain the three outstanding infections—the gonococcal, the streptococcal, and the tuberculous. The first two invade the genitalia from below, and constitute the so-called ascending infection; while the last attacks from above, its primary pelvic focus being always the Fallopian tube, and is known as the descending infection. The unbroken genital mucosa of the healthy adult is attacked only by the gonococcus and the tubercle bacillus. A vaginitis in a woman otherwise healthy means always a gonorrhœa. Streptococcal infection occurs only in a canal damaged by child-birth or abortion, or wounded by some trauma, either accidental or deliberate.

The host once invaded, their pathogenic life history begins. Each lives it in its own way The gonococci prefer always the mucous membrane, spread by contiguity, do not penetrate very deeply, and so do not specially implicate the blood-vessels and lymphatics. From the vagina they enter the cervix, traverse the uterus, and finally reach the Fallopian tubes, where they flourish. A salpingitis results which almost invariably involves the ovary, the catarrhal salpingo-ovaritis of gonorrhœal origin, which is as a millstone hung about the neck. So it may persist more or less quiescent for years, a perpetual torment. Pus at any time may form, often a mixed infection, the pyosalpinx with indrawn fimbriæ, or the tubo-ovarian abscess. The lesion remains generally intraperitoneal and tends to become bilateral. With time

the virulence of the organism becomes attenuated, and in purulent exudate it rapidly perishes.

The streptococci from their point of entrance neglect the mucosa and penetrate deeply from the first. Rapidly they implicate lymphatics and blood-vessels, and are swept therein. Their choice is always the loose vascular connective-tissue, and they find this in abundance in the parametrium. They multiply therein, and remain for the greater part extraperitoneal, the viscera being only secondarily involved, save the ovary which lies in the direct lymph channel. Pus may, or may not, form, and the inflammatory "mass" is commonly unilateral, and may remain pelvic or extend to the groin or flank. The virulence of the organisms is extreme, though they lie for years quiescent.

The tubercle bacillus from some previous focus, frequently a caseating gland, drops in detritus to the pouch of Douglas. By the lymph current it is swept into the Fallopian tube. Tubercle formation, a chronic salpingitis or a pyosalpinx with everted fimbriæ, even of enormous size, may develop. The condition is usually bilateral, is almost entirely intraperitoneal, and the ovary frequently escapes. Though its life is long its virulence is not great. (I have purposely not spoken of the blood infection.)

Such, then, is the life history of these several organisms, and in their respective ways they so give rise to the inflammatory "pelvic mass." It is with this mass as a clinical entity that we now have to deal. Very fortunately for the clinician, these three infections often persist as they begin, separate and distinct, and, behaving in a way peculiar to each, remain recognizable from beginning to end. All, in common, occasion the "inflammatory mass," but the "mass" of the one can clinically be distinguished from that of the other. Instances of cross-infection and hybrid growth, of course, occur; but these are the exception and not the rule. So in actual practice there emerge the three clinical varieties—the gonorrhœal, the streptococcal, and the tuberculous, to name them in the order of their frequency and importance. I shall draw very broadly their distinguishing clinical characteristics:

1. The gonorrhœal variety of the inflammatory "pelvic mass." A history of purulent leucorrhœa and previous urinary disturbance is sometimes of value. Pus in the urethra or vulvo-vaginal glands, or evidence of old inflammation, for example, a skenitis or the *maculæ gonorrhoicæ* about the Bartholinian ducts, are important; a Bartholinian cyst is pathognomonic, while a granular vaginitis or a catarrhal cervix may each occur. Such evidences may persist for years in untreated cases, and most cases are untreated, and their tale is unmistakable,

XUM

a gonorrhœal infection has passed that way. Noeggerath's latent gonorrhœa leaves, of course, no such serpent's trail. The resulting "mass" is a salpingo-ovaritis, and may be of any size. It is frequently pelvic and not large; very often it is bilateral with the uterus recognizable between. Whether single or double these "masses" are commonly elastic, have a definite, rounded contour and a boundary sulcus more or less distinct, which marks the lesion as visceral and intraperitoneal. To the bimanual examination, and this is the important point, the sense is that of a rounded or pyriform body with no complete indentification with the uterus or pelvic wall. The "masses" occupy the pouch of Douglas, and the uterus may not be greatly displaced. All degrees obtain; sometimes the landmarks are entirely obliterated, but the above is a common finding. The diagnosis is based upon the evidences of gonorrhœa below and the physical characters of the "pelvic mass."

2. The streptococcal variety of the inflammatory "pelvic mass." The history is valuable, and begins with child-birth or abortion, or some operative interference sometimes self-imposed. If acute, the fever is high and the illness extreme. Pain is marked often down one leg, and that knee is flexed. Examination may, or may not, show an old gonorrhœa; if so, there is a mixed infection. The vagina is hot and dry, and the "pelvic mass" is usually unilateral, firm, and discoid in shape with no limiting sulcus. Within the pelvis it gives the sense of set plaster-of-Paris firmly fixed to the pelvic wall. The uterus is often greatly displaced and the rectum compressed from before backward. The "mass" is of any size, and may project into the pelvis below or extend upward to the groin or flank. The uterine appendages may be indistinguishable, but frequently are swollen and sensitive. The diagnosis is based upon the history, and the recognition of the "mass" as extraperitoneal.

3. The tuberculous variety of the inflammatory "pelvic mass." Frequently the history is only of failing health and some menstrual depravity; this is the lesion of the young and unmarried. There is no evidence of gonorrhœa, though there may be cervical catarrh. The mass is cornucopia-shaped, and frequently bilateral, elastic, rounded, and with definite contour. Pea-like nodosities may be found in the isthmian portion of the tube. The uterus is recognizable and not greatly displaced. The ovaries may be healthy and distinct. The diagnosis rests upon the history, absence of the evidence of gonorrhœa, and the character of the elastic, fusiform, intraperitoneal "pelvic mass."

In all three cases the leucocyte count and cultures taken from

the "mass" may be of distinct service; where tuberculosis is suspected the Von Pirquet reaction is often valuable.

The relative frequency of these different infections is fairly to be judged from my own practice. From 164 operative cases, 113 were gonorrhœal; nineteen were tuberculous; seventeen were streptococcal (twelve puerperal and five non-puerperal), and fifteen were of mixed infection. Here, as elsewhere, gonorrhœa far outnumbers all the rest put together.

### Treatment of the "Inflammatory Mass."

Palliative Treatment: During the past eight years I have treated 344 such cases. Of these 180, or more than half, escaped operation; palliative and hygienic treatment gave fair results. Of this palliative treatment rest is the great factor, and rest in bed; and youth and individual resistance determine the result. The nature of the infection or the size of the "mass" is here no contra-indication, for nature may work pelvic miracles. Witness the three following cases:—

1. Girl of eighteen, patient of Dr. Evans, gonorrhœal "choked pelvis," with the crest of the "mass" nearly to the umbilicus. Palliative treatment gave, in a year, a pelvis normal to palpitation. The girl subsequently married, and was safely delivered of a child.

2. A woman of twenty-eight, tuberculous salpingitis. Four years ago both tubes were swollen to the size of the index finger, and were nodular and sensitive. Steady improvement followed rest out-of-doors. For a year she has resumed her ordinary life, her menstrual habit has been restored, and the tubes are now normal in size, though slightly fibrous and nodular.

3. Woman of thirty-five, with a large, left-sided, extraperitoneal "mass" in the pelvis reaching to the iliac crest. The whole left half of the pelvis was occupied, and the uterus was pushed far to the right. The patient was bedridden, complained of sciatic pains, and the left leg was flexed and wasted. She gave the history of puerperal infection the year before; this was probably streptococcal, as the illness was acute for three months, though there was no abscess formation. Under palliative treatment which included hot air baths, massage, and electricity, the condition rapidly improved. A year later all functions were restored, and the patient was active, and about the house, though there was still a small "mass" in the pelvis.

Operative Treatment: Here I have followed always the technique established by Dr. Gardner, the chief of the department. In eight years I have operated upon 164 cases of the inflammatory "pelvic mass" with three deaths—a mortality of 1.8 per cent. In all these

XUM

cases the recognition of the nature of the infection and the method and time of interference are all-important. Upon these things everything depends. If the infection be streptococcal it is never safe to open the abdomen, as the organisms are persistently virulent. Moreover, the main "mass" here is always extraperitoneal, and consequently irremovable, and even if the diseased uterus or its appendages be extirpated the chief lesion is still beyond surgical help. A cœliotomy in such a case is absolutely futile and extremely dangerous. It should never be performed, as a streptococcal peritonitis is almost inevitable. Yet such an operation, even as other surgical blunders, is not so rare. I have performed it twice myself; and the result was, in one, a death, and in the other a protracted and stormy convalescence. Crossen, of St. Louis, tabulates a series of twenty-three such cases, where, after a cœliotomy, five died; a mortality of nearly twenty-two per cent. In all these cases, then, the abdomen should remain unopened; surgical interference should only seek to establish drainage, to evacuate abscess cavities as they form, and the methods should be always extraperitoneal, either a colpotomy below or above the groin or a flank incision. Mixed infections, either gonorrhœal or tuberculous, if they occur here, must wait. Sixteen such cases I have treated in this way without a death. One, a puerperal case, lay in hospital six months and required four successive incisions; while another, infected from the careless use of a sponge-tent, became convalescent only after three operations for drainage. The great difficulty is always to recognize the condition. Yet in most instances its personality is plain, and to be forewarned of it is to make few mistakes.

In the gonorrhœal "pelvic mass" all surgical interference is contraindicated during the acute stage. A cœliotomy at this time incurs heavy additional risk, and in waiting there is no harm. The exacerbation sooner or later burns itself out as the organisms perish. Posterior colpotomy with complete tunnelling of the "pelvic mass" is a wise, curative, and conservative measure, and should, I think, be even more frequently undertaken. Extirpation of the diseased organs should only be made as a last resource.

With the tuberculous "pelvic mass" the converse obtains. If the lesion is progressive the sooner it is removed the better. Posterior colpotomy has here no place. Extirpation is the only cure.

# Case-Reports

## CEREBRAL MENINGOCELE

R. T., age, six months, was admitted to the Victoria General Hospital, Halifax, on October 2nd, 1909, with a large tumour, the size of a man's fist, attached to the back of the head in the sub-occipital region. The mother of the child said that at the time of the child's birth the tumour was the size of a plum, but that it rapidly increased in size until it acquired the above dimensions. Otherwise the child was healthy and well developed, mentally and physically. The tumour was globular in shape and slightly pedunculated; its surface was smooth and the skin over it was fairly thick. When examined with light in a dark room it was translucent and showed no dark bands or shadows. On holding the hand over the tumour it grew tense, and there was an impulse present. Pressure lessened the size of it. Fluctuation was also noticeable.

The child was operated upon on October 4th. He was prepared for operation in the usual way; the head and tumour were well shaved and sterilized. Chloroform was the anæsthetic used. Two elliptical flaps of skin were cut out on either side of the tumour, so that the base of each flap corresponded to the pedicle of the tumour. The flaps were carefully separated from the cyst and reflected. The pedicle of the cyst was well exposed at its exit from the skull, and the flaps were separated from the dura mater and reflected up to the edges of the gap in the occipital bone on either side. The cyst was then aspirated and a large quantity of clear fluid taken from it. During the whole operation the child's head was kept on a plane lower than the pelvis. The cyst was now opened and the pedicle transfixed, and each half ligatured with hemp thread. A continuous suture of hemp thread was then used to cover the stump, and the wound was closed in layers. Silkworm gut was used to close the skin incision. A small, thick, sterile pad of gauze was put over the wound, and a large sterile dressing was applied over this. The child was then put in bed with the head low; he was kept in this position for forty-eight hours.

A meningocele occurring in the sub-occipital region may be looked upon, in most cases, as a simple dilatation of the fourth ventricle of the brain. In this child, on opening the cyst, all the structures of

XUM

the ventricle were plainly seen. The ventricle itself was large enough to hold at least an ounce of fluid, and its lining membrane was continuous with that forming the wall of the sack. The opening in the case of this child was circular in shape and had a diameter of an inch and a quarter.

The dangers incidental to operations on cases of this kind are convulsions, shock, and sepsis. To guard against convulsions it is essential that the amount of cerebro-spinal fluid withdrawn in any given time should be under the control of the surgeon. If he can control this he will be able to regulate the gradual reduction in intracranial pressure and the change in the circulation in the cerebro-spinal system caused thereby. In emptying the cyst with an aspirating needle the operator has control over both these factors, and he is, therefore, able to reduce to a minimum the danger of convulsions occurring during operation. To help to prevent the too free escape of fluid, the child's head was kept low during the progress of the operation.

On the day after the operation the temperature went up to 103°; the child was given an aperient with good result. On October 6th the temperature was 102°. The child rested comfortably through the night and was quite quiet, though it vomited curdy material several times. On October 8th the temperature was normal, and remained normal. From October 5th to 12th, its pulse ranged between 150 and 160, and respirations between 55 and 60. On October 13th the pulse dropped to 130 and the respirations to about 35, and remained at this. After October 8th, the child got along nicely.

As the operation had to be performed rapidly to guard against shock, the flaps were not trimmed enough and a surplus of skin was left in them. To get rid of this redundant skin and to prevent the lines of union in the skin flap and in the meningeal flap from being opposite each other, a second operation was performed on October 16th. The old wound was incised, and an incision about half an inch from the first was made in its full length and parallel to it and the intervening piece of scalp dissected away. The edges of the incision were then undermined and the wound closed with silkworm gut sutures. This brought the line of union in the skin flap half an inch to one side of the line in the meningeal flap, and made a better and firmer scar. The child was discharged well on October 27th.

Halifax. N. E. McKay, M.D.

## OPERATION FOR POTT'S DISEASE OF THE SPINE

M. McE., aged 51. In August, 1910, a diagnosis, borne out fully by the patient's history, of Pott's disease was made in the case of this patient, and he was admitted into the wards of the Montreal General Hospital. At that time he made the following complaints: (1) he had been suffering from an almost continuous burning pain in his back and under the sternum for twelve months; (2) during this period he had lost about forty pounds in weight.

On admission there was found to be a partial dulness from the 1st to the 4th rib on the right, and from the 1st to the 5th on the left. Over these areas the breath sounds were harsh and of a somewhat bubbling character. The spines of the 1st, 2nd, 3rd, and 4th dorsal vertebræ were prominent and somewhat enlarged. The 10th, 11th, and 12th dorsal spines were also prominent and presented a somewhat similar condition, whereas the 5th, 6th, 7th, and 8th spines were at a much lower level and made a hollow. Over this hollow there was tenderness on pressure. The knee jerks were somewhat increased. The other reflexes and sensations were normal.

The possibilities for the treatment of the tuberculous lesion in the spine of this patient did not seem hopeful. It was useless to attempt fixation by plaster, because of the age and disposition of the patient, and the position of the lesion was not favourable for such form of treatment. Fixation by a brace also was out of the question. Recumbency, with extension and counter extension, was, therefore, resorted to. Under this treatment the patient's condition rapidly grew worse. On November 26th, 1910, a careful examination was again made. It was found that there was complete loss of sensation to heat and cold, pin pricks, or cotton wool, in the legs and up to the umbilicus in front, and to the 10th rib behind. Above this, for a distance of 10 cm., sensation was blurred, while above the 4th rib in front and the 8th rib behind, sensation was apparently normal. He had a double ankle and rectus clonus. Babinsky and Oppenheim signs were present. The knee jerks are markedly increased and the legs were in a separated condition. The 3rd, 4th, and 5th dorsal vertebræ were not tender to the touch. He had no control over his bladder, and continually complained of pain in the epigastrium and the lower costal borders. He had great difficulty in voluntarily moving his legs.

The question that presented itself was, what was to be done?

XUM

Last May, Professor Lange, of Munich, reported at a meeting of the American Orthopædic Association, at Washington, that eight years ago he had made his first attempt to get fixation of a diseased spinal column by operative procedures. He carried two steel wires, 4 mm. thick, one on each side of the spinal processes, under the muscles, and fastened them with silver wire above and below. These had to be removed in a few months because of the formation of abscesses. They acted as a cause of aseptic suppuration, as does sublimated silk in tendon transplantations. Tin was therefore substituted by Professor Lange,—steel splints carefully covered with tin. Professor Lange's first operation with these tin-coated steel splints was performed two years ago. Since this operation his patient has worked at the anvil in a smithy. The operations performed from that time have been few, but the originator of the operation seemed confident that the procedure was a good one.

The patient, whose condition is being discussed, was rapidly losing ground and becoming paralyzed. Rest by fixation of the spine was the treatment indicated, and yet this seemed impossible by ordinary procedures. It seemed a case, therefore, to try the method suggested by Lange. The spines of the 4th, 5th, 6th, 7th, and 8th dorsal vertebræ were fixed, and I have to report progress towards the betterment of the patient's condition. The wound healed by first intention, and he was sitting up in a chair in less than two weeks after the operation. The condition of his nervous system is also improved. The operation performed on this patient was done about a month before the writing of this report. This history, therefore, is not presented as that of a patient cured of Pott's Disease by operation, but rather as illustrating a procedure both justifiable and to be recommended in certain exceptional cases of tuberculosis of the spine.

A. Mackenzie Forbes.

Montreal.

# Editorial

## A VISION REALIZED

THE Canadian Medical Association was founded in 1867, but for many years it had an existence which was more or less limited and precarious. It was only in September, 1907, that a new constitution and by-laws were fitted to the growing needs. Incorporation as a legal body was afterwards obtained, and at the present moment the Association is equipped with a Journal as its official organ. To assemble in one fixed and permanent organization all the physicians in so wide a dominion, dwelling in so many provinces, with interests so numerous and varied, was no small task, and many minds wrought upon the problem before the present happy solution was found.

More than sixty years ago this plan of coöperation assumed form in the mind of Dr. Francis Badgley, and it may be interesting to reproduce a letter which he wrote upon the subject to the editor of the *British American Journal*. It is addressed from Little St. James Street, Montreal, and bears the date of August 31st, 1849:

"I avail myself of the columns of your Journal, to advert to a subject, the importance of which, in reference to the medical profession of Canada, I have been deeply sensible of ever since my return to this country in 1843. I mean the establishment of a medical association for this province; an association having for its objects the advancement of medical science in all its branches, the maintenance of a journal devoted in an especial manner to the interests of our profession, and the establishment of union and good feeling among men engaged in the same pursuits; with eventually the formation of a fund for the relief of the widows and orphans of those of our members who have been, by the dispensation of an all-wise Providence, either removed by death from the

scenes of their operations, or by loss or accident incapacitated from continuing to practise.

"Many of your readers will doubtless remember, that in the pages of the *Montreal Medical Gazette*, the pioneer of the excellent Journal under your editorial management, the formation of such an association was strongly advocated, and preliminary steps were even taken by the writer of this letter, in his capacity of Secretary to the Montreal Medico-Chirurgical Society, to bring about, through the Toronto and Quebec Medical Societies, a consummation so devoutly to be wished. Although the measures of reform proposed at that time in connexion with the one above alluded to, have all been satisfactorily carried out, this single desideratum has been as yet unattempted.

"My attention at this moment has been again strongly directed to the consideration of the feasibility of this project by two circumstances: first, the perusal of the proceedings at the highly interesting anniversary meeting of the Provincial Medical and Surgical Association held at Worcester, on the 1st and 2nd August last, under the Presidency of Dr. Hastings, the original founder of that Society; and secondly, your own statement in the last number of the *British American Journal*, to the effect that, unless the amounts due by subscribers were sent in as speedily as possible and the subscription list extended, your respected publisher would be under the necessity of discontinuing the Journal.

"Now it appears to me, Sir, that these two points are matters of deep and equal interest to every member of the medical profession in Canada; and in entreating my professional brethren to obviate an occurrence which would be so much to be deplored, as the loss of the only Journal which we possess exclusively our own, I would suggest to them a plan which, if approved of, would not only secure its healthy maintenance, but also would be the means of carrying out the scheme with which my letter opens.

"Let then a 'British American Medical and Surgical

Association' be formed, consisting of all those gentlemen who at present are, or may hereafter become, members of the respective medical societies in existence throughout the province. Of these there are already, the Montreal Medico-Chirurgical Society, the Toronto Medical Society, the Quebec Medical Society, the Niagara Medical Society, the Frontier Medical Society, the Medical Society of the Eastern Townships, and perhaps several others.

"Let other branch societies of this description be established generally, and at a stated period of the year let a general meeting for scientific and social purposes, of the members of all these, take place at some city or town in rotation throughout Canada, and be recognized as the 'British American Medical and Surgical Association.' Let every member of the Association subscribe yearly one pound currency, and for that sum let him be entitled to a copy of the Journal bearing its name, as well as a copy of its transactions, should it be deemed advisable by the Association at any future time to select, either from the papers submitted to any of its branches, or at its annual meeting, such as are deemed worthy of publication. By this means a heavy personal responsibility for the carrying on of the Journal would be removed from your shoulders, in addition to your gratuitous services given already for five years as editor; and the members of the profession, as is the case in Mutual Assurance Companies, would at once feel that the Journal was their own and demanded their mutual co-operation and support.

"I will now close this letter with an extract from the admirable speech delivered by Dr. Hastings, on the occasion referred to, with regard to the value of the 'Provincial Medical and Surgical Association,' premising only, that this association, which began fifteen years ago with eighty members, now enrolls two thousand. 'I here witness,' says he, 'the triumph of the social principle; and the subjection of all low, paltry, and selfish interests to the interests of man; it is the principle which promotes peace; it is the principle of true honour; it is the principle of the Christian religion.'"

XUM

## HOSPITAL TROUBLES IN HALIFAX

FROM time to time there have been indications that all was not going smoothly in the Victoria General Hospital in Halifax. Into the long history of all these troubles it is not our intention, at present, to enter, but we may note that for several years the hospital has been administered directly by the government of Nova Scotia, which is responsible for its maintenance, and that one of the charges of its critics is that party politics figure too largely in the management of the hospital and in the consideration of appointments. We must also admit that there seems to be some incompatibility of ideas, if not of temper, among the staff. The government has recently appointed a commission to administer the affairs of the hospital, and sincere hopes are entertained that a new era is dawning for this important institution, and that it may soon command, even more than it has done, the trust and support of the profession and public throughout the province. Considering all the circumstances of the case, the previous history of the hospital, the numerous interests, frequently conflicting, which are involved, the atmosphere of party politics that has been made to surround the hospital, local prejudices and professional animosities, the commission has no easy task before it. The personnel, however, of the commission commands the respect and confidence of the whole community, and we believe each member is animated by a sincere desire to devise such improvements in general management and such a scheme of medical organization as shall place the hospital in a position to fulfil all the functions of a first-class institution.

A hospital has three functions. The first is generally recognized,—it is a place for the treatment of sick and injured people. Secondly, it is the place where properly educated persons are trained to study and treat disease. This is its educative function. It is the technical school of

medicine. In the third place, it has a scientific function. It must contribute to the general store of knowledge. It is the great laboratory of medical science. No hospital, at least no public hospital, is doing all its duty unless it serves these three purposes. To secure such results in a hospital service, a thorough organization of its medical staff is demanded. In each department, medical, surgical, and, if the hospital be a large one, in the various special departments, there should be a chief visiting officer with an assistant, or senior and junior assistants, and a resident medical officer. Such a "unit of staff" should be sufficient for a service of thirty to sixty beds, and in large hospitals several such "units" would be required. In clinical hospitals there would also be, as part of the staff, students holding appointments as ward clerks and dressers. The records might be kept by the clerks, but in all large hospitals there would be great advantage in having a fully qualified medical man as registrar, to supervise the taking of case histories, to collate and arrange these, and carry on the necessary correspondence with medical men sending cases to the hospital, and with former patients. The pathologist should, of course, be not only a graduate in medicine, but one specially trained in practical pathology. And it is essential to have not only a completely furnished *post mortem* room, but a well arranged museum, where specimens of diseased organs and tissues removed by operations, or obtained at autopsies, may be preserved for study. In the museum, too, may be stored the volumes of clinical records, with photographs, drawings, casts, and models.

We regard the assistant as indispensable. In no other way can a succession of men properly qualified as hospital physicians and surgeons be secured. It is especially on the surgical side that such an arrangement is necessary. Without some such plan, difficulty, if not disaster, must occur in the event of a vacancy occurring in the position of the chief of the department. In large cities the conditions may not be

XUM

so acute, as there may be experienced surgeons available, but in many places the vacant post can only be filled by selecting some one from among the general practitioners, and this is often an extremely difficult task, for there may be many applicants with all sorts of influence, social, political, even ecclesiastical, and, it may be, with no qualifications for the post beyond the legal and technical claim of any duly qualified and registered practitioner.

Now, the great advances of science, and, especially, the ability to cope with infective diseases, have made it possible for the general practitioner to undertake and to perform successfully many operations which at one time would only be attempted by surgeons of special skill and experience. But it has, at the same time, opened up a still wider field in which greater technical skill and a larger experience are required of the surgeon than ever before, so that surgery is becoming more and more a specialty. And, as the surgery of the eye, for example, has long been recognized as a special branch, in which an operator is expected to have special skill, so the public is beginning to recognize that special skill in surgery is the result of special training and special advantages. The well-to-do requiring surgical help can go where and to whom they please. The poor man must go to the nearest hospital, and the duty of the hospital is to give him the best it can.

Can any one contend that a general practitioner is fully competent to undertake the surgery of a general hospital? As regards medicine, it may be at once admitted that a general practitioner who has been in practice for some years, who has won the confidence of the public as a successful practitioner and the esteem of his colleagues as a scientific and broad-minded man, should be competent to undertake the duties of a hospital physician. It is equally certain that the longer a man has been engaged in general practice without any special opportunities of doing surgical work, the less fitted is he to undertake the onerous duties of a

hospital surgeon. And in these days, when hospitals are numerous and it is "the vogue" to go to hospitals for even minor ailments, the opportunities of the general practitioner for doing surgical work are becoming rarer. The mere fact that a general practitioner may have achieved success in surgery does not, in itself, qualify him as a competent hospital surgeon, whatever public opinion may say. Much depends on the nature of the cases. A few years ago it was a feather in a man's cap to have operated successfully for appendicitis. There are few men now with any pretensions to surgery who have not had their successful cases. Many cases of appendicitis are among the simplest and easiest of operations. But there are pitfalls in the diagnosis of appendicitis. We do not envy the position of the man who, with the average equipment in surgery of the general practitioner, and newly appointed to a hospital staff, finds on opening the abdomen that the supposed appendicitis is an irreducible intussusception, a cancer of the ilieo-cæcal valve, or an impacted renal calculus, to mention a few of the cases of error in diagnosis. He is at least a man, and will do his best and learn by his experience. But has justice been done to the patient? Would this surgeon not have been better fitted for his work if he had been for, say, five or ten years attached to the surgical wards of a hospital, associated with an experienced man, and assisting in all his more important operations? The hospital is primarily for the sick, and it is both just and humane that they should have the best that experience and training can give.

In many of the hospitals in this country the term of hospital service is intermittent, one set of attending officers taking duty for six, or even for only three, months, to be succeeded by another and different staff. One result of this arrangement is that a larger number of men in a community attain to the dignity and prestige of being hospital physicians or surgeons, but this is a doubtful advantage. It diminishes the actual value of the appointment as a means of gaining

XUM

experience. The strongest argument in its favour is that where, as in the majority of cases, at least in the smaller towns, the members of the hospital staff are all in general practice, the strain of daily attendance at the hospital and its demands on time are too great. But with properly selected and appointed assistants this objection falls to the ground. The visiting physician or surgeon may not be able to be present every day, but his assistant can take his place, as also when the chief takes his annual holiday. In this way the assistant becomes accustomed to responsibility, and in due time is prepared to take his place as chief.

We need not dwell on the requirements of that indispensable man, the resident medical officer. He is usually a recent graduate, one of the pick of his year, his knowledge at his finger tips, and thoroughly acquainted with all the routine work of a hospital. All he needs is more experience, and his responsibilities soon commence, for emergencies are constantly occurring in a hospital at other times than the visiting hours. Each chief of a department should have his own resident medical officer, as no man can serve two masters. Upon such considerations as these alone can the commission expect to produce results which will be permanent.

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## EXPERT EVIDENCE

THE medical experts in New York have reduced expert evidence to the extreme limit of absurdity. Five alienists appeared before Judge Swann in the court of General Sessions, and testified that a prisoner on trial for wrecking a bank was insane. The jury immediately contradicted them, and declared that the prisoner should be put to the bar. In this decision the judge concurred, and complimented the jury upon their "horse sense."

The section on neurology and psychiatry of the Academy of Medicine were unwilling to let the matter rest. They invited Mr. Jerome, of counsel for defence, to address them, and inform them fully of this strange procedure. Mr. Jerome is reported to have said: "Your profession has been insulted by this half-baked judge, who holds office by the grace of Charlie Murphy, and so has mine. I love my profession and you love yours, and we will not stand to have them dragged into the mire. The proceeding was the most ridiculous and absurd on record."

It seems that the insult was more glaring than appeared at first sight. Mr. Jerome had twelve alienists at hand. Only five had testified, and seven more were ready to corroborate their testimony, when Judge Swann intervened, and informed him that the "court had been aided sufficiently by the evidence which had been submitted." It is no wonder that he feels "deeply and bitterly," that the two great professions of law and medicine have been slighted.

If this aggrieved lawyer and these offended alienists will cast their minds backwards, they may discover that, if their professions have been dragged in the mire, the fault is their own. Upon a famous occasion one of these same alienists was reminded that he had given diverse opinions upon the same case; and he admitted frankly that his opinion depended upon the side which engaged him.

The common remedy which is offered to prevent the unedifying spectacle of two physicians swearing to the truth of opposing opinions is that medical experts should be appointed by the courts. The real remedy is that any physician called upon to testify should constitute himself an officer of the court, for the sake of ascertaining the truth about the matter in hand, and that he should not allow his opinions to go beyond the warrant of the facts. No one hears that the profession of medicine is "insulted" in the Canadian courts.

XUM

## TEACHING BY PANTOMIME

PANTOMIME, that is, a series of actions, such as gestures and postures, for the purpose of conveying ideas or information, is the lowest form of expression. It is very commonly employed in conversing with persons who are deaf, with primitive peoples, and in the teaching of medicine.

Surgeons who, in speaking of appendicitis, for example, are not content with mentioning McBurney's point, but place the hand upon their own anatomy between the anterior superior spine of the ilium and the umbilicus; or indicate, more or less accurately, with the finger, the intersection of the right semi-lunar line and the interspinal line at the external border of the rectus abdominis muscle, when they have occasion to alude to Clado's point, are abandoning speech for pantomime.

Various other points which go by the names of Broca, De Mussey, Erb, Halle, Monro, Valleix, Robson, Vogt, Voillemier, and Ziemssen, if they are indicated by gestures, will call attention to portions of the anatomy which might be left to the imagination, especially if the speaker is possessed of an asymmetrical figure, and, we shall say, of a Robson's, a Voillemier's, a De Mussey's, or a Monro's point, which is unusually protuberant.

Demonstrations by movements of the hands to illustrate form or surgical procedures fall within the same category. They rarely add to the clarity of the verbal description. They indicate a poverty of verbal expression. They are often ridiculous; and sometimes they are vulgar. Words without pantomime are entirely adequate for the didactic teaching of medicine.

## RAILWAYS AND TYPHOID

A MATTER that has been allowed to exist because people have grown used to it, and because no one has called attention to its danger, is the unsanitary method adopted by various railroad companies of disposing of excreta from the lavatories of their trains. The arrangement is crude, offensive, and a positive menace to public health. How dangerous it is, appears when it is recalled that such lavatories are often used by persons with various infectious diseases, such as the early stages of typhoid, where the excreta are a menace wherever they fall. If to those actually suffering from this sickness is added the unknown number of typhoid carriers, the danger becomes appreciable. And so with other disease. At present there is the possibility of cholera being carried into Canada. Let one or two undeveloped cases escape the port-examiner, and take train into the country, and an opportunity is at once given for the spread of this malady.

It needs little imagination to follow the method of such a spread. The house fly is always at hand to do its share. Excreta passing through trestle-work into streams soon pollutes a water, or milk, supply. Above all, the wind sweeps up and scatters the dried matter in all directions. Swept into the air by a storm, this disease-breeding dust may be carried many miles from its source, and the chances of infection increased a thousand fold. An explanation is not wanting for many of the outbreaks of typhoid in isolated rural and prairie districts.

More sanitary arrangements should at once be insisted upon. The difficulty of approaching and dealing with matters of this class would be much lessened if there were a Dominion Board of Health, the need of which is becoming more and more apparent. There are many subjects which are too wide in scope to come under the powers of a provin-

XUM

cial board, but which could be effectively dealt with by a central board. The attention of all medical authorities is urgently directed to this question.

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## GOVERNMENT LABORATORIES

FEW persons appreciate the extent and value of the scientific work which is being carried on at the government laboratories in Ottawa. From the beginning, even so technical a subject as bacteriology has had its place; but, since Mr. Lehmann left the staff to accept an appointment under the government of Burmah, this important method of investigation has been in abeyance. On February 4th, one of the buildings of the Department of Inland Revenue was destroyed by fire. In the reconstruction the needs of bacteriology will be met, and Mr. Aimé Valin, who for many years was in the department of chemistry, has been engaged for the work.

It might be proper to consider if the time has not come for establishing a closer correlation between the various laboratories. At present there are four laboratories which may undertake water analyses from different points of view. Each may present a scientifically correct report, and yet a different shade of opinion may be expressed by each laboratory. Four laboratories are dealing with food problems. The work overlaps and may be duplicated. Where chemical and bacteriological knowledge is necessary in arriving at a correct judgement, the combined opinion of those who have become expert in each subject will carry more weight than the opinion of any one individual.

By a correlation of the various laboratories under a directing head or laboratory board, a number would be prevented from working on a single subject, and the sending out of opinions, not entirely in harmony with each other,

would be avoided. The expense caused by duplication would be prevented, and the efficiency of each laboratory would be raised. The appointment of a director of laboratories has much to recommend it; but in the meantime a laboratory board composed of the various heads would accomplish much. It could meet as often as necessary to become acquainted with all the work which was being done. It would have power to allocate to each laboratory, irrespective of the department under whose auspices it was organized, work proper to it. In each case such allocation would be made to the laboratory best fitted, according to the training of the officer in charge and to the equipment at his command.

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## THE JOURNAL AND THE PROFESSION

THE editing of a journal for the medical profession in a country so large as Canada is merely a process of selection. The yearly volume contains less than twelve hundred pages, and every offering must be measured by the space at command. But the task can only be adequately performed if the editor has all the material to select from.

Until the time comes, when each department of medicine will have a publication devoted to its own interests, the present journal must serve the needs of all. This arrangement has its own advantages, since all medicine is one, and there is no sharp dividing line between the various aspects of it. General practitioner and specialist then stand upon common ground.

Those who take the trouble to read the JOURNAL will not fail to observe that it is arranged in a series of departments. This is not entirely a matter of accident. It is intended to meet the needs of contributors; and they are besought to select for themselves the department which they desire to strengthen, and to conform with its requirements.

XUM

The division known as "Original Communications" is intended for articles of a formal nature; and a less elaborate presentation may be obtained under "Case Reports." It is quite unusual, however, that a paper as read before a society is suitable for publication in the exact form in which it is given. The editorials are intended to give expression to those sound opinions which are, or are assumed to be, or should be, entertained by the profession. If it is the intention of a member to enlighten the JOURNAL, there is a form of expression ready at his hand.

It is a common complaint that the pen and ink men in the profession monopolize the journals to the exclusion of those who work but do not write; and, more specifically, that the general practitioner neither receives what is his due nor has an opportunity of giving of his experience. To meet this condition there is a department for "things adjudged," be those things great or small, for the convenience of those who are willing to convey to the profession the result of a well founded experience,—something "practical," as it is commonly called.

If the larger hospitals appear to receive more attention than their importance warrants, and the smaller hospitals less, that can be remedied only by those who are able to restore the balance, namely, by the attendants upon the smaller hospitals. Reports of societies will be received gladly and will be accorded space according to their importance. The JOURNAL is not a great sheet which comes down from heaven: it is an instrument of the profession to be used by all in the interests of all.

## PHYSICAL EDUCATION

IN a new country fresh problems in education arise continually. When the early settlers came to Canada they were confronted by a physical task. From the Atlantic to the prairies of the west was an unbroken forest, and they occupied themselves in felling trees, building roads, bridges, and houses. But in the life of the present generation there has been a radical change in national habits, much like that which occurred in the United States somewhat earlier, so that now over sixty per cent. of the whole population are town dwellers. The introduction of machinery has taken the place of muscular work for the adult; and the crowded street and the school have deprived the children of those natural occupations, and even of play, which are so necessary for their normal development.

Medical teaching must then consider this great shifting of conditions; and they must be met in the mass, just as tuberculosis has been fought as a social condition affecting the common good, rather than an individual problem between physician and patient. It is to well-trained physicians that the school board should be able to apply for counsel in designing exercises to counteract the cripling effects of confinement to a fixed posture in young, active, and growing children. He should be prepared to advise intelligently the periods of rest and activity to develop the physical powers that will suffer from neglect, and he should have that special knowledge of the physiological sequence of plays to be followed in developing the child from infancy to maturity. It is to the physician that the alderman should be able to go for assistance in providing properly supervised play in spaces reserved as play-grounds in the crowded districts of the city, if inevitable physical degeneration is to be avoided.

Among university students it has been demonstrated that an appreciable acceleration in growth and weight can be

XUM

produced by carefully supervised exercise, and this is accompanied by an increase in mental efficiency. The hunger for muscular exercise natural in all growing children and young men must be stimulated and satisfied if their efficiency is to be even safeguarded, and no medical education which ignores this problem can lay just claim to completeness. Dr. Tait McKenzie, whilst he remained in Canada, taught this lesson incessantly, and he has continued to teach it in the United States from his chair in the University of Pennsylvania. At the annual dinner of the faculty of medicine of McGill University on February 2nd, where he was the principal guest, he took up the lesson anew. Some days later, namely, on February 7th, reports were read from all the faculties at a meeting of corporation on a remit which had been sent down to them a month previously. The faculties had been asked for an opinion on one aspect of the case, namely, the physical examination of all students entering the university, and they reported unanimously in its favour. The corporation adopted the report, and next year the regulation will go into effect.

# Book Reviews

AMERICAN PRACTICE OF SURGERY. A COMPLETE SYSTEM OF THE SCIENCE AND ART OF SURGERY BY REPRESENTATIVE SURGEONS OF THE UNITED STATES AND CANADA. Edited by JOSEPH D. BRYANT, M.D., LL.D., and ALBERT H. BUCK, M.D. Complete in eight volumes. Vol. VII, 961 pages. Published by William Wood and Company, New York, 1910.

The seventh volume of the "American Practice of Surgery," edited by Bryant and Buck, is a good book, a thorough and detailed discussion of the various subjects being given. The articles are written, as a rule, by men whose names lend importance to their views. As a whole, it leaves the impression of a general high standard, great care in preparation, and very striking fairness wherever there is considered to be a difference of opinion among the American surgeons.

The volume opens with an article on the diseases and wounds of the pelvis and gluteal region. The author seems to feel that his field is so encroached upon by previous or coming articles as to leave little for him to discuss and turns with relief to an excellent chapter on sacrococcygeal sinuses. In the discussion dealing with the surgical diseases of the extremities, the author turns this disadvantage into gain and confines himself to a number of affections peculiar to, or deriving great importance from, their situation in the extremities; among others, the question of hand and finger injection, with its importance as a factor in many serious and disabling deformities; and the result, after both proper and faulty treatment, is capably dealt with, and is an excellent guide in the treatment of these trying conditions.

A full review of a volume of this size cannot be given here, and reference can be made only to the more important of the subjects treated. The surgery of the pericardium, heart, and bloodvessels is a book in itself, and covers fully and completely the whole question of the surgery of the vascular system, anatomical relations, with their importance, wounds of heart and vessels, thrombosis and embolism, various methods of suture of vessels, with reports on cases and detailed descriptions of technique.

The section on surgical diseases and wounds of the stomach is equally full and clear, being an impartial discussion of the indications for operative treatment, with a fair presentation of alternative methods, and a detailed, easily followed description of the operative technique. The illustrations are here particularly good and well used.

XUM

The section on general septic peritonitis, which should be one of the important sections of the volume, is, perhaps, one of the least satisfying, being largely a decsription of types of operative technique, a description where a full discussion would have been of more value.

The divisions on tuberculous peritonitis, hernia, and appendicitis require no further comment than that they are completely and accurately given, the views held and the methods practised by the best known surgeons of Europe and America are fully illustrated and clearly described.

The last section, dealing with the surgical diseases of the rectum and anus, is one of the most interesting and valuable of the whole work. The various diseases are taken up in detail. The anatomical relations and pathological changes; the symptoms and differential diagnoses; the indications for operative or non-operative treatment; and, as far as possible, the reasons for each, are thoroughly gone into. Like all the other articles, this division is freely and most usefully illustrated.

MODERN SURGERY. By JOHN CHALMERS DA COSTA, M.D. Published by W. B. Saunders, 1910.

To those of us who remember the first edition of Da Costa's "Surgery," in 1894, at that time the ideally compact, and small, student's book, the present appearance of the sixth edition, a portly volume of fifteen hundred pages, comes as a surprise. Yet nothing could better illustrate not only the extraordinary advances in scientific surgery of these sixteen years, but also the change of idea in what we expect the modern student to be acquainted with. The reviewer was always an enemy of the compact catalogue of facts, and a friend of the larger treatise. Even for the needs of students, the larger book had time and space for the discussion of principles, as well as for the enumeration of facts, and the time spent in obtaining a clear understanding of principles was always well spent, better spent, at least, than if it were devoted to memorizing facts. In this sense we may welcome the comparatively large size of the present edition.

All the newer things receive more or less adequate description. Thus, the work of Murphy, Carrel, Matas, and Crile, in blood-vessel surgery; the work of Matas and Halsted in the treatment of aneurism; the operative treatment of recent fractures; the use of positive and negative air pressure in intrathoracic surgery; the recent work in acute peritonitis, in cerebral decompression, in spinal cord operations; the work on the thyroid and the parathyroids; Bier's hyperæmia; modern views on the treatment of inflammation; immunity in its surgical

aspects; bacterial vaccines; the serum diagnosis of cancer;—all these, and a number of other modern things, are described. In the way of adverse criticism, not much can be said. Little things one notes here and there, such as a lack of positiveness concerning the spirochæta pallida as the cause of syphilis; the unjustifiable endorsation of Ballance and Stewart's views on nerve regeneration; the error of omission regarding the cause of malignant œdema in leaving out Welch's B. ærogenes capsulatus; and so on. On the other hand, much of what was written in the first edition that was old-fashioned even then is retained; such as, the value of leeches, the application of a succession of blisters, the causing of pustulation by means of Vienna paste, as a method of treatment, extremely precise directions for the use of drugs, such as antimony, and other old-fashioned depressants in the treatment of inflammation.

A Text-Book of Surgery for Students and Practitioners. By George Emerson Brewer, A.M., M.D., Professor of Clinical Surgery, College of Physicians and Surgeons, Columbia University, New York; Surgeon to the Roosevelt Hospital, etc. Second edition. Published by Messrs. Lea and Febiger, Philadelphia.

It has been a pleasure to review this work, which consists of over 900 pages, and contains 415 engravings and a number of beautiful plates by the Lumiere process. The use of the latter process marks a distinct advance in text-book illustration. Dr. Brewer was the first to adopt it in the illustration of medical literature. The engravings are, in many instances, original, and include illustrations of the most recent operative procedure and mechanical appliances.

It is needless to refer to the work in detail, as it covers the subject of surgery in all its sub-divisions in a complete and concise manner, without the brevity of the manuals. To illustrate the completeness of the work the reference to rectal anæsthesia might be mentioned. Dr. Brewer, in addition to introducing the latest procedures and methods, has added much to the value of the text-book by giving his own views and experience, the latter of which has been exceptionally wide.

XUM

# Res Judicatæ

## HUMAN AND BOVINE TUBERCULOSIS

THERE is one feature which distinguishes scientific and medical work in the United States from that which is done elsewhere. The workers in other countries may have shown greater originality, but the workers in the United States surely excel in what may be termed mass work of a practical nature, undertaken by the government and other official bodies. One recalls the Catalogue of the Surgeon-General's Library, the various reports and publications of the Bureau of Animal Industry, the Index Medicus, the Massachusetts reports upon Filtration, the studies upon small-pox, and other diseases by the Harvard school. Now there comes from the New York City Department of Health, a study which is far and away the most thorough and extensive study of the bacteriology of human tuberculosis that has yet appeared. The title is transcribed as follows:

*Park and Krumwiede* (with seven assistants), The relative importance of the Bovine and Human types of Tubercle Bacilli in the different forms of Human Tuberculosis. *Journal of Medical Research*, Vol. XXIII, 1910, pp. 205-368.

Every medical man knows how leisurely is the growth of the tubercle bacillus, consuming days as compared with the hours needed for most other pathogenic organisms. And some may know the weeks, not to say months, that are requisite before the whole life history of a particular strain can be worked out. As a result, taking the medical literature of all countries, and the output of all the innumerable laboratories and of Royal Commissions working over many years in England and Germany, there were, until the middle of 1910, only some 650 cultures of the bacillus gained from human cases of the disease, that had been carefully worked out and published, to afford indications as to whether they were of the human or the bovine type. Dr. Park and his collaborators in New York, from one single institute, now publish the results of a study of the bacilli obtained from 436 cases, and the results are as significant as they are instructive, confirming the overwhelming majority of German and English observations. Out of 291 cases of pulmonary phthisis they have not found the bovine tuberculosis present in a single instance. In other words, the commonest and most dangerous manifestation of the disease in man, most dangerous because it becomes open and infective, is always derived from a previous human case. In fifty-four cases of tuberculous cervical

glands they gained the bovine type twenty times; in six cases of abdominal tuberculosis, four times; in fifteen cases of tubercular meningitis, once. They did not once encounter it in seventeen cases of tuberculosis of the bones and joints, and in forty cases of generalized tuberculosis of different origins they only encountered it six times.

Nor are the figures less significant with regard to the age incidence of the disease due to the two types. Adults sixteen years and over afforded 296 cultures of the human type, and but one of the bovine. Children from five to sixteen years gave forty-five human, to nine bovine, whereas children under five years of age gave twenty-two cultures of the bovine type to sixty-two of the human type. There could not be a more striking confirmation of what is now the accepted teaching, namely, that young children are susceptible to infection from cow's milk, whereas adults rarely owe their affection to this cause. Park and Krumwiede give a separate table of nine cases from a New York Foundling Hospital where the children are practically fed exclusively on cow's milk. Of these nine cases they isolated the bovine type from five, the human from four.

It may be urged—it has been urged—that this difference between the relative frequency of the two types at different life periods is due to an infection in early life by the bovine organism, and its gradual adaptation and transformation to the human type. The New York studies afford little, or no, support to this suggestion, and, as the report points out, the cases thus far published favouring the view are open to criticism. Were the argument valid, then in a long series like the present we ought to find a large number of "intermediates." But these are strikingly few. Inoculation into rabbits and other recognized differential methods divide the cultures into two well-marked classes. Admittedly, different strains of tubercle bacilli exhibit variation; no two are absolutely identical in all their properties, but it is found that the variations in the bovine type gained from man as often depart from as they approximate towards the properties of the human type; so also that, whereas in one property a given strain may approach the human type, in another it departs from it. The indications are that the bovine type in man preserves its bovine qualities.

The conclusion is obvious; namely, that the disease set up by bovine infection in man tends strongly to be self-limited; while transmissible under experimental conditions it is not transmitted under conditions of ordinary environment. The only open forms of disease it may set up are ulcerative tuberculosis of the intestines, and, possibly, infantile infection through the mother's milk. But as regards the latter, the above figures show that the mother so rarely suffers from

generalized tuberculosis of bovine origin that this may be neglected, and as regards the former, tuberculous infection from man to man through the agency of fæcal matter must be of the rarest.

These observations do but confirm many of like nature made of late years in other countries. Abundant data have also been afforded that, save under conditions so abnormal that they are eminently unlikely to present themselves in nature, the human type of bacillus is incapable of causing generalized tuberculosis in the cow. They wholly support the position taken by Professor Adami two years before Koch's celebrated and unfortunate pronouncement at the London Congress in 1901 and based upon the work of Sidney Martin and Theobald Smith and the observations of himself and C. F. Martin at Outremont, that the eradication of human and bovine tuberculosis may be proceeded with independently. Professor Adami then urged upon the Dominion Government that it had an unrivalled opportunity to lead the world in the eradication of bovine tuberculosis. In the first place, whereas in the main European countries, over large areas as many as thirty per cent. of the cattle suffer from this disease, in Canada, over large areas, the disease is not existent among cattle, and on the whole its frequency may be placed below ten per cent. But if a general crusade against the disease were too large and costly a matter, there was one small Province which afforded the ideal opportunity for eradicating the disease. Prince Edward Island has excellent agricultural land and an intelligent population. Dr. Adami urged that in this well isolated province the government should undertake a crusade against bovine tuberculosis, employing Bang's well known method of segregation.

The evidence that has accumulated during the last twelve years, culminating with this recent work shows that Dr. Adami's argument was well founded: that bovine tuberculosis can be eradicated even where no satisfactory efforts have been made to arrest the disease in man, and the time is ripe to make the experiment. Render the cattle of the Island free from tuberculosis, and this could be accomplished within five years, then Prince Edward Island, with its government guarantee, would obtain a celebrity and a market for breeding purposes that would bring wealth to Canada. The difficulty now is that buying from well-known herds in the Old Country and in America, so widespread is the disease and so insidious, it is almost impossible to obtain or to give guarantees that the animals are untainted. If, under government supervision, the Islanders could turn their attention to the breeding of choice stock absolutely free from the disease, practically the whole world, the United States, Great Britain, Europe, and the Argentine, must come to Prince Edward Island to replenish their herds.

# Retrospect of Surgery

## CLINICAL REMARKS ON 348 CASES OF INJURY TO THE EYES

GAYLORD C. HALL, M.D., *Ophthalmology*, October, 1910.

The writer prefaces his remarks by dealing with the importance of keeping careful and accurate notes of all injuries to the eyes. Particularly is this to be emphasized in view of the fact that any one with defective visual acuity, the result of an accident, will, in the natural course of events, become a tax upon the community. The important position which the specialist has to occupy in a large number of cases pertaining to the Employers' Liability Act, where justice has to be maintained between both employer and employee, emphasizes the wisdom of the selection of the subject-matter.

The large majority of cases reported are those of such eye injuries as were referred to the author for diagnosis and treatment from one large manufacturing concern. He notes, at the onset, that men working on sand blasts, or emery wheels, for a length of time, invariably suffer from defective vision. Of a large number of men employees examined, it was rare to find one who had more than six-twelfths, or half, of normal vision. Regarding the use of protective glasses, the workmen seem to complain that dust and sweat blurr the lenses from the start, and that, later, the emery cuts the glass so that they consider they are in more danger from the blurred glasses than from the possible injury inflicted on the unprotected eye. It seems that the average workman is too careless or shiftless to keep the lenses clear.

Meddlesome interference on the part of fellow-workmen, in the case of foreign bodies, is shown to be responsible for a very large number of ulcers of the cornea, which resulted in permanent defect in the visual acuity. Of 243 cases of foreign bodies in the cornea, in sixty-three cases a previous attempt at removal had been made with subsequent ulceration of the cornea in forty-two. The method of treatment usually adopted was removal of the foreign body under cocaine, with aseptic precautions, treating the eye with argyrol and yellow oxide of mercury ointment, and the use of a bandage. The use of dionin in cases of injury to the cornea other than by foreign bodies is very strongly advocated, as well as the employment of oil dressings and compress bandages. In twenty-seven cases of burn of the lids, sclera, and cornea, those who suffered were, as a rule, moulders, and the injury was generally very

XUM

severe. In six of the cases, pieces of the metal were extracted from the bed which it had formed, generally in the lower cul de sac. The improvement in vision, as shown in a number of these cases carefully refracted, is recorded.

In a series of cases of perforating wounds of the globe, the author states that no hard and fast rule for enucleation of the globe can be laid down, but remarks that his experience has taught him that aside from cosmetic reasons, an eye which has no perception of light and which is at times irritable and soft, ought to be removed. Patients are too often prone to defer seeking advice until the healthy eye is involved, when, frequently, they are in such a position that expert advice cannot be obtained.

### ON THE SIGNIFICANCE OF TRACHOMA CORPUSCLES

ZUR NEDDEN, *Archiv. f. Augenheilkunde*, LXV., s. 355.

The recent investigations of Zur Nedden on the chlamydozoa described by Halberstetter, Prowezek, Greff, and others, causes a very definite element of doubt as to the absolute diagnostic import of these bodies in trachoma. Zur Nedden has found them in the conjunctival epithelium in cases of blenorrhœa neonatorum, spring catarrh, follicular, simple, and blepharo-marginal or diplobacillary conjunctivitis, as well as in other forms, more especially those in which a marked swelling of the papillæ is evident. That these bodies are microörganisms has yet to be proven; it is quite within the range of possibility that they are alterations of the cells which develop during the inflammatory process as reactions to the toxic action of the etiological factor. The author gives it as his opinion that investigation should be directed not to the epithelium and the follicle, but to the adenoid tissue about the follicle, if we wish to make any definite progress in our researches for the etiology of trachoma. A review of the investigations as so far carried out compels the author to concur with Professor Schmidt-Rimpler in his opinion that the primary etiological factor of trachoma is yet to be discovered.

### THE PATHOGENIC ELEMENT OF TRACHOMA

ADDARIO. *Archiv. Ophthalmol.*, September, 1909.

The author in this contribution has attempted to determine the particular peculiarities of Prowazek's bodies, and to distinguish them from the bodies frequently noted in the epithelial cells of the normal conjunctiva as well as in various forms of conjunctivitis. Five cases of typical acute trachoma, with distinct follicle formation, were studied, and Prowazek's bodies were found in all of these, as is usually the case,

in the cell protoplasm of the conjunctival epithelium. He studied mixed forms of the disease as well as follicular forms, and found bodies which were similar in form, size, appearance, stain, and contents to those noted in the acute form of the disease.

In order to distinguish these bodies from the forms noted by Bertarelli, Cechetto, and Mijaschita, in the epithelium of the ordinary form of conjunctivitis, the author investigated three cases of diplococcus conjunctivitis, two cases of conjunctival catarrh where microörganisms could not be found, and two cases of ophthalmia neonatorum. The technique and observations were carried out under precisely similar conditions. Preparations from the cases of diplococcus conjunctivitis showed a collection of small bodies which presented the same appearance and had the same staining properties as those found in trachoma. Blenorrhœa neonatorum presented similar findings, and in the two cases of conjunctival catarrh the usual little bodies were found embedded in the cytoplasm of the conjunctival epithelium. In careful observations of epithelium from the normal conjunctiva, he found that the small granular bodies are a normal condition in the cytoplasm. The author states that consequently the presence of these bodies is of no diagnostic value in trachoma, or in other forms of conjunctivitis in which they may be found. He further emphasizes the fact that, for the positive recognition of the forms described by Prowazek, one must be familiar with all the different changes which can be produced in the epithelial cell of the conjunctiva during the preparation.

### EXTRACTION OF CATARACT IN THE CAPSULE

SMITH, MAJOR H. Jullundar, Punjab. *Ophthalmic Record*, February, 1910.

The extraction of the cataractous lens in the capsule is the term employed to distinguish it from the incomplete operation where the cystotome is employed. The method, as formerly employed by Pagenstecher, has, in the author's opinion, to be relegated to the past, for, with the introduction of a spoon behind the lens into the vitreous cavity, a serious loss of vitreous was the inevitable result.

Major Smith has performed 20,000 cataract extractions in the capsule, and 3,000 operations with capsulotomy. The author states that the combination of lens capsule in the wound and the liquefying débris of lens matter in the anterior chamber are of the nature of a chemical irritant, causing iritis and irido-cyclitis. Normal healing of the wound is also inhibited. These factors account for the fact that in India the capsulotomy operation is followed by an incomparably greater mortality of eyes, from all causes, than from the intracapsular operation. Major

Smith states that in uncomplicated cases he can extract cataracts by this method with a loss of vitreous in less than two per cent., and in complicated cases of less than five per cent. The method is only applicable to senile cataracts, and atrophine is not used, and the author is against the use of strong antiseptic solutions. A sclero-corneal incision is made which is finished in the cornea, and the beginner is recommended to perform an iridectomy.

"In the case of an immature lens, or of a hard cataract, with a spatula in the operator's left hand ready for use if required, he proceeds to press back with the point of a strabismus hook towards the optic nerve, the point of the hook being placed over the lower third of the lens. The pressure is steady and the point of the hook should not be moved until the upper edge of the lens tilts forwards, and is thus seen to be dislocated, having been made to swing on its transverse axis. The moment the lens at the wound is seen to be dislocated, the pressure at the point of the hook is gradually turned more and more towards the wound, pressure being maintained all the time so as to keep the lens up to the sclerotic margin of the wound, the pressure with the hook becoming gradually lighter and lighter and the hook gradually sliding after the lens until the cornea is folded beneath it; at this stage it is delivered. In a low tension eye the beginner should follow up the lens with the spatula, in addition to the hook, as with it he can maintain sufficient tension in the eye and thus allow his right-hand instrument to follow up the lens more lightly."

Possible complications are avoided by the careful reposition of the iris, and the tags of vitreous, should any escape, should be carefully snipped off with scissors in order that a drain may not occur at the point of incision, and healing be thus retarded. The author is averse to any device, used for dislocating the lens, which is inserted into the interior of the eye.

### LIEUT.-COLONEL SMITH'S OPERATIONS IN BOMBAY

MAJOR KILKELLY, *Indian Medical Gazette*, May, 1910.

A very adverse opinion as to the wisdom or justice in performing the Smith operation is recorded in a series of twenty-three cases upon which Colonel Smith operated while in Bombay in 1909. The operations were performed in the hospital during the Bombay Medical Congress, and the results are as follows: 1 case, 6-XV; 2 cases, 6-XX; 7 cases, 6-XXX; 4 cases, 6-XL; 5 cases, fingers 10 to 18 feet; 1 case, moving bodies. Accidents during operation: capsule ruptured, 5; vitreous escape, 2. Complications: incarceration of iris in lips of wound, 5; capsule tag in wound, 4; vitreous opacities, 9; iritis, 7.

Major Kilkenny, who had performed 500 intracapsular extractions, has been forced to conclude that after the results obtained by one with such a vast experience as Lieut.-Colonel Smith, the routine procedure of such an operation should be discouraged in the best interests of the patient, except in unusual cases. He considers Lieut.-Colonel Smith's method of replacing the iris pillars by a strabismus hook to be responsible for a large proportion of the number of prolapses of the iris after the iris has been forced into the corners of the wound. As the eye, in the vast majority of cases, rotated upwards, it was difficult to see what the end of the tenotomy hook was doing; to many it appeared to be merely stirring up the vitreous. In some cases, it seemed that the pressure exerted was excessive; heavy lenses shelled out with the utmost ease. In other cases, it was only the undoubted determination and persistence of the operator that brought about the desired results, or, perhaps, caused a ruptured capsule or escape of vitreous. It is impossible for one like Lieut.-Colonel Smith, who frequently performs as many as fifty extractions in a single day, to make the routine preliminary examination, or to keep trustworthy statistics and reports.

### ON ENUCLEATION AND TRANSPLANTATION OF FAT

LAUBER, HANS, *Zeitschr. f. Augenheilk.* Vol. XXIII, May, 1910.

Heteroplasty, by means of metal or glass, may give good results, but the danger of failure is always possible, as the implanted foreign substance may not be tolerated by the tissues. During the past two years, Lauber has implanted fat in thirty-seven cases of enucleation and reports his results:—

During the process of enucleation, each rectus muscle is grasped with the forceps, and after it is severed from its scleral attachment, a double-needled suture is inserted. When the globe has been excised, a sponge is pressed against the wound in order to arrest hæmorrhage. A piece of subcutaneous fat from the abdominal wall is then excised. It should be large enough to fill the capsule of Tenon without causing much tension. Lauber found it best to make a rectangular incision into the abdominal wall, one side of which runs into the linea alba. A careful hæmostasis is necessary in order to avoid hæmatomata. The recti are united over the implanted fat, then Tenon's capsule with catgut, and the conjunctiva with silk. The superficial wound of the abdomen is also sutured. The after treatment lasts a little longer than in the case of the ordinary enucleation, and œdema of the lids and conjunctiva may occur for several days. The conjunctival sutures are removed in eight or ten days, and two or three weeks later an artificial globe is inserted.

XUM

Four failures were recorded: in one case of an eye shrunken by chronic traumatic iridocyclitis, the sutures cut through the brittle tissue on the fourth day, exposing the fat, which became necrotic. The final result was the same as in enucleation without implantation. After the enucleation of a microphthalmic eye, the tension of the tissues was, no doubt, too great, and the sutures did not hold. In two other cases the sutures gave way and the fat became necrotic.

By this method Lauber finds that the artificial eye has a much better position and motility. During the first few months, the implanted mass sinks somewhat and becomes more dense, doubtless due to the fact of its being pervaded with connective tissue elements. Lauber also intends to fill the sclera with fat in cases of evisceration, as has been successfully done by Velez and Lopez. He thinks that in patients who complain of the artificial eye sinking in the conjunctiva, Tenon's capsule might be incised, the ends of the recti taken up by sutures, and after the insertion of a pad of fat, again united.

### THE TUBERCULIN TREATMENT OF EYE AFFECTIONS

HUMMELSHEIM, E. *Archiv. f. Augenheilkunde.* 66, s. 59.

The conditions which beset one in the intelligent treatment by tuberculin must not be regarded as simple. The treatment aims to promote an active immunization of the diseased organism, involving a number of factors which cannot be sufficiently controlled. Consequently, a wide experience with the various forms of tuberculin is necessary, if one is to expect intelligent results. Hummelsheim considers it imperative to make an attempt with very small, but with clinically active, doses, such as will not promote serious disturbance in the general system. Following Saathoff's experience, Hummelsheim treated two cases of bilateral, disseminated choroiditis, and one of serous iritis. After a positive reaction to an initial injection of 1 mg. of old tuberculin, he commenced, two days later, with $\frac{1}{100}$ mg., which elicited a marked reaction at the puncture, without rise of temperature, in all three cases. After a dozen injections at intervals of seven days he reached $\frac{1}{10}$ mg.; the temperature rising only in exceptional cases and not above $\frac{2}{10}$ C. The foci in the choroid subsided, vision improved, and the uveitis cleared up. He observed that all three patients, who were treated ambulatorily, gained in weight and their general health was considerably improved.

Regarding the choice of a tuberculin, Saathoff considers this irrelevant, as for none of them has an antibacterial action been proven. Correct doses, and the most favourable interval of time, are the two features of the greatest importance to consider. Old tuberculin is

cheaper, more durable, and a more exact dosage can be obtained with it than with new tuberculin or with emulsion. Experience must decide the comparative value of the three tuberculin preparations, and Hummelsheim reports his cases, inviting further contributions on the subject.

### THE CLINICAL CONGRESS OF THE SURGEONS OF NORTH AMERICA

ALTHOUGH the majority of his readers may not agree with the writer in the *American Journal of Clinical Medicine*, who, in describing the work accomplished at this congress last November, made the statement that it showed that the best surgical work of the world is being done in the city of Chicago, all must agree that the meeting was one of great importance. The fact that twelve hundred surgeons from all parts of the United States and Canada, and, indeed, from foreign countries, were present, would in itself signify its importance. The plan of supplementing meetings at which papers are read, by one given up almost wholly to clinical work, has supplied a need of the surgeons of North America. The congress, from all accounts, was a great success. There was a wealth of clinical material on hand, some brilliant surgery was seen, and the programme, even to the handling of the large gathering, was effectively managed. Some of the most important clinics and operations are described by Dr. Lanphear, in the *American Journal of Clinical Medicine*. "Unquestionably," he says, "the most marvellous piece of work exhibited was that of restoration of the forearm by Dr. John B. Murphy. A man had the entire flesh of his forearm burned away from about three inches below the elbow to the annular ligament. Five years after the accident, there was nothing to be found except cicatrix, periosteum, and bone, and the thumb and fingers were absolutely valueless; yet, a reparative operation was designed and carried out in this manner:

"First step: By an hour's careful work the entire scar was cut away, leaving nothing but a bunch of contracted, atrophied muscles near the elbow, the denuded periosteum of radius and ulna, and the structures at the wrist. Second step: The tendon of each digit was brought down from the palm and split so as to double the length; then the muscles and fascia at the elbow were split and stretched until they readily reached the tendons, so as to permit of suturing without tension, and were then temporarily dropped. Third step: A piece of skin five inches wide by nine inches long was cut from the abdomen of the patient, together with all the underlying fat down to the fascia of the external oblique. Through this fat were next passed, directly beneath the skin, five slender dressing-forceps. Then, taking up in each of these forceps

the end of one of the newly made flexor tendons, the latter were brought, one by one, through the fatty tissue, which henceforth will act as *'tendon-sheaths'; and, lastly, the tendons were sutured to the sep-* arated parts of muscles near the elbow. When all were perfectly adjusted, the skin was sutured at the edges, with extreme care. Fourth step: The wound of the abdomen was closed by sutures and Thiersch graft. The first dressing was made at the end of two weeks. *Perfect healing had occurred, with the exception of one stitch-hole* near the elbow. Already the man could flex fingers and thumb to considerably more than a right angle.

"Among the operations which caused most comment was one by Dr. Franklin H. Martin for suspending the retroverted uterus by a strip of peritoneum taken from the anterior wall of the abdomen and passed through the back of the fundus, as well as when he 'unrolled' *the fimbriated extremity of the Fallopian tubes. Until quite* recently tubes which are 'clubbed' by closure of the abdominal ostium from gonococcal infection have been regarded as hopeless and have been removed by hundreds of thousands. Dr. Martin pulls these tubes outside the abdomen, surrounds them with gauze, and then strips the contained pus outward, 'milking the tube,' he calls it, forcing the fluid out by 'hydraulic pressure.' It is astonishing how the closely adherent *fimbriæ open outward, permitting a sound to be* passed into the uterus without difficulty. Inasmuch as the pus has become sterile, i.e., the imprisoned gonococci have died, in a large proportion of cases—as often demonstrated by microscopic examination—Martin believes that the tubes thus treated remain patulous. It is true he has had, thus far, no pregnancy following the conservative treatment; but he declares that the menstrual flow becomes seemingly normal, and that the patients are all cured as to symptoms.

"One young woman was exhibited at one of the clinics who had had bony ankylosis of both hips, so that walking was impossible. Both joints were opened by sawing through the great trochanter and turning it and the attached muscles up out of the way; the bony union was cut away with chisels, and a new synovial membrane made by covering the head of the femur by a flap of the fascia lata with its attached fat; the trochanter was wired back; then the wound was closed without drainage and not opened for three weeks, when the fixation cast was removed. At the time of exhibition of this case the woman walked about the hospital with only the slightest limp.

"The most phenomenal result obtained," says Dr. Lanphear, "was also in the service of Dr. Murphy. A girl of eight lost all of her right humerus except about two inches above the elbow, but a part

of the periosteum was preserved. A piece of bone with its normal covering was taken from the girl's tibia and put in her arm, the lower end being pushed into the medulla, and held in place by a small nail driven through. The upper end of this improvised humerus was prevented from grinding upon the intact synovial covering of the glenoid cavity by the interposition of a flap of fascia and fat carefully sutured over and around it. In two years a new humerus has grown almost as large as the opposite one, the shoulder-joint has perfect motion, and the child has a strong and useful right arm."

An operation, which Dr. Lanphear describes as "most wonderful," was performed by Dr. Daniel Eisendrath; namely, a bloodless prostatectomy. "Bandages were bound around the thighs of the patient close to the hip and around each arm at the shoulder, tightly enough to produce decided cyanosis of all extremities. Dr. Eisendrath then made a long cut above the pubes, pushed the peritoneum off the bladder and opened the latter with a cut fully three inches long—and no blood flowed. The prostate was then seized with vulsellum forceps and pulled upward, the mucous membrane was cut behind the internal meatus and the prostate shelled out, and this without the loss of an ounce of blood, and with but little destruction of urethral tissue. The cavity was then packed tightly with iodoform gauze, the bladder-wall was sewed by two rows of chromic gut, except at the point of drainage, and lastly the external wound closed carefully. Then the man was lowered from the extreme Trendelenberg posture and the bandages removed. Only trifling secondary oozing occurred."

At the conclusion of the meeting, a permanent organization was effected, and it was decided to hold a similar congress yearly.

### THORACIC SURGERY

ESLBERG. Intratracheal Insufflation; *Annals of Surgery*, July, 1910, page 23.

This method of maintaining lung inflation in the presence of open thoracotomy was first described by Meltzer and Auer. Under general anæsthesia a tube is passed through the larynx to about the level of the bifurcation of the trachea, and air mixed with the required amount of ether vapour is blown continuously through the tube under a pressure of from ten to twenty mm. of mercury. If the tube is correctly placed, air can be heard to enter both lungs upon auscultation. For a full description of the apparatus devised for clinical use one should refer to the *Medical Record* for March, 1910. Howard Lilienthal in the same number of the *Annals* reports the first case of thoracotomy in the human performed with the aid of Meltzer's method of lung inflation.

XUM

ARTIFICIAL RESPIRATION AND INTRATHORACIC ŒSOPHAGEAL SURGERY

GREEN AND JANEWAY, *Annals of Surgery*, July, 1910, page 58.

These authors describe an improved cabinet for intrathoracic work. This apparatus permits a true artificial respiration independent of the efforts of the patient. By this means the authors have been able to keep a fully curarized dog alive for four hours. The authors further discuss the relative values of the various negative pressure chambers, positive pressure apparatus, positive pressure masks, and the insufflation method of Meltzer.

Quinby, *Surgery, Gynæcology and Obstetrics*, November, 1910, page 482, describes Meltzer's method and its application to animal work, and gives the results of his experiments upon thirty dogs with the employment of this method. In conclusion Quinby expresses the opinion that the method of Meltzer rests on a firm physiological basis.

SAMUEL ROBINSON. Acute thoracic empyema. Avoidance of chronic empyema. Rib trephining for suction drainage. The *Boston Medical and Surgical Journal*, Vol. CLXIII, No. 15, Oct. 13th, 1910.

Robinson states that the chief object of this communication is to emphasize the necessity of early diagnosis. Early diagnosis and drainage of purulent collections in the thorax is essential to save life in some cases; in all, prompt evacuation shortens the period of convalescence. Not only the saving of life but complete restoration of function should be aimed at. Chronic empyema is a condition which should practically never occur, and in every case is to be attributed to late recognition, late or inefficient drainage, or failure on the part of the surgeon to provide means of artificial expansion. In every case of pneumonia the danger of effusion should be constantly borne in mind and thoracentesis practised upon the slightest indication. Diaphragmatic and interlobular collections may alone escape this method of diagnosis if persisted in. If local anæsthesia is employed, repeated punctures may be performed without danger, pain, or discomfort to the patient.

In differentiating lung abscess from localized empyema, Robinson lays stress upon the presence or absence of sputum. On the other hand abscesses situated near the periphery of the lung may lead to the formation of adhesions between the visceral and parietal pleuræ, and, when full, give the physical signs of localized empyema. Such collections not infrequently rupture into a bronchus and are dismissed with the diagnosis of "empyema rupturing into a bronchus," whereas

the lesion is strictly pulmonary. Robinson thinks that localized empyemata on the lateral walls of the chest are more commonly pure peripheral lung abscesses or restricted empyemata connecting with and secondary to abscess formation in the lung; further, that while pleural effusions frequently occur secondary to lung abscess, it has not been established that pure empyemata ever rupture into the air passages. Although Morison states that interlobular empyema is the variety which most commonly ruptures into a bronchus, in two such cases seen by Robinson at autopsy both were associated with adjacent lung abscesses. Robinson concludes from his experience in some seventy thoracic cases, that the *x*-ray as a means of differentiating between purulent pleurisy and intrapulmonary conditions is very unsatisfactory, failing especially in those cases where one needs help.

Robinson does not regard the bacteriology of empyema as an important factor in the selection of treatment. Whether the material obtained in diagnostic thoracentesis shows a pure infection of pneumococcus, streptococcus, staphyloccus, or the three combined, drainage by operation is indicated and its advantages proved by the superior results obtained. Further, while it is true that perfect restoration of function may be secured in early cases by simple drainage and a firmly applied dressing, recovery is undoubtedly hastened in all cases by the employment of artificial methods of reëxpansion. In subacute cases which have remained undrained until the collection of pus is large, or where the primary drainage has been insufficient (intercostal), or placed too high, and adhesions or the presence of residual pus prevents expansion of the lung, suction or other artificial means of reëxpansion must be employed if a chronic condition is to be averted.

The methods of Buelau, Perthes, Baylor, and others, embodying the three principles—siphonage, suction, and valvular action—possess in common the lack of permanency of the air-tight closure. To meet this defect Robinson has developed a method of rib-trephining and the use of a threaded, metal tube. The technique of the procedure is, briefly, as follows: under local anæsthesia the skin and soft tissues are incised and the rib periosteum reflected. A cranial trephine, the exact outside diameter of the tube to be inserted, is then applied directly over the centre of the rib, care being taken to leave a bridge of rib at least 3 mm. in width above and below the trephine opening. After removing the button with mouse-tooth forceps, a fine aspirating needle is inserted into the pleural cavity to verify the selected point of drainage. Care should be taken not to infect the superficial tissues. A short, threaded, metal tube is then screwed into the bone defect and the muscles and skin sutured and a collodion dressing applied. Next,

XUM

the exposed pleura is excised through the tube and the pus allowed to escape into a basin. Finally, a piece of rubber tubing six inches in length is attached to the outer end of the metal tube and clamped when the flow of pus has ceased, thus preventing the entrance of air. After returning the patient to bed, siphon or suction drainage is attached to the tube before again releasing the clamp. Great care should be exercised subsequently to avoid leakage in any part of the apparatus. This method is applicable to acute or subacute cases where digital exploration of the empyemic cavity is unnecessary.

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## Personal

Dr. J. J. Thompson has been appointed medical health officer of North Vancouver.

Dr. F. C. Bell has been appointed medical superintendent of the Winnipeg General Hospital.

Dr. Helen MacMurchy, who for the past six years so efficiently edited the *Canadian Nurse*, completed her editorial work on that journal in December last. She has been succeeded by Miss Bella Crosby, of Toronto.

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## News

Philadelphia has been selected as the place of meeting of the second clinical congress of the surgeons of North America. Although the date has not yet been definitely fixed, the committee announces that the meeting will probably be held November 7th to 16th, inclusive, 1911.

The annual report of the provincial board of health for British Columbia for 1910, shows that during the year there were 130 cases of diphtheria, with a death rate of 10·7 per cent., 318 cases of scarlatina,

5·01 per cent. being fatal, 56 deaths from typhoid, and 180 cases of smallpox. Among the recommendations is the establishment of a laboratory for the manufacture of sera, especially diphtheria antitoxin.

At a meeting of the citizens of Portage la Prairie held January 23rd, it was decided to erect a monument and drinking fountain to the memory of the late Dr. F. B. Lundy.

With the January issue, the *Saskatchewan Medical Journal* appeared under the new name of the *Western Medical News.*

During October, November, and December, 1910, 2,733 cases of measles were reported in Montreal.

The annual report of the Royal Victoria Hospital for 1910 shows that during the year 4,309 patients were admitted, an increase of 109 over the previous year. These consisted of 2,361 Protestants, 1,386 Roman Catholics, 492 Hebrews, and 70 of other faiths. Of these, 3,176 were residents of Montreal, and 1,133 came from districts outside of the city. On January 1st, 1910, there were 282 patients in the hospital remaining from 1909, and during the year 4,371 were discharged, of whom 2,510 were well, 1,160 improved, 203 not improved, 201 not treated, and 297 died. There were remaining in hospital December 31st, 1910, 224. Of the 297 deaths, 86 took place within forty-eight hours of admission. The death rate for the year has been 6·68 per cent. or, if those dying within forty-eight hours after admission be deducted, 4·8 per cent. In the out-patient department the total number of patients treated was 4,532; the number of visits of these patients aggregated 30,830—medical, 8,282; surgical, 5,947; eye, 4,179; nose, throat, and ear, 5,320; diseases of women, 1,654; nervous diseases, 1,539; orthopædic, 1,499; dermatological, 1,496; genito urinary, 914. The ambulance made 1,481 trips, as against 1,174 from the previous year. The past year witnessed the final completion of the fire proofing throughout the building.

The report of the superintendent of the Western Hospital, Montreal, for the year 1910, shows that the number of patients admitted during the year was 1,291, which, with 67 remaining over from 1909, made a total of 1,358 treated. Of these, 692 were females and 666 males. An increase of 2,193 patients was shown in the number treated in the outdoor department, the figures for 1910 being 12,878. Of the total number of patients treated during the year, 802 were surgical cases,

XUM

435 medical, and 121 gynæcological; 528 were Catholics, 755 Protestants, 45 Jews, and the remainder of other faiths. Seventy-five deaths occurred during the year, of which twenty-four were within forty-eight hours of admission.

THE National Association for the Study and Prevention of Tuberculosis reports that during the year 1910 nearly $15,000,000 was spent throughout the United States in the fight againt tuberculosis. This amount is nearly double that used during 1909 for the same purpose. Of it, over eleven million of dollars was used for treatment in sanatoria and hospital.

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## Obituary

DR. J. H. ARMITAGE, of Waterloo, died January 18th, from a fracture of the spine. Dr. Armitage was born in Newmarket in 1860, and graduated from McGill in 1886. He is survived by a widow and two children.

DR. ROBERT PERCIVAL MCKENZIE died January 16th, at Rossland. Dr. McKenzie was born in Thurlow, Ontario, in 1875, and graduated from McGill in 1904.

DR. GIDEON BARNABY, of Digby, died January 10th, 1911. Dr. Barnaby was born in Cornwallis, and in 1871 graduated in medicine at Harvard. He began practice at Petite Riviere, Lunenburg County, where he remained until 1885, when he removed to Bridgetown. Dr. Barnaby gave up active practice in 1907, and spent the last of his life on his farm in Grenville. He is survived by a widow and one daughter.

DR. EDMOND ROBILLARD, of Montreal, died January 13th, 1911. Dr. Robillard was born in 1825 at Montreal. Entering the College of the Assumption, he went through an elementary training there, later taking up his advanced studies at the Victoria School of Medicine and Surgery, which ultimately became affiliated with the present Laval University. He was twice married, first, in 1854, to Miss Adeline Loranger, sister of Judge Loranger, who died in 1873, and his second wife was Madame Antona Maguel. Dr. Robillard was one of the oldest physicians in Canada.

# Canadian Literature

ORIGINAL COMMUNICATIONS

*The Canadian Practitioner and Review*, February, 1911:

Monstrous and Multiplex Births . . . . John Knott
The Use of Scarlet Red in the Treatment of Ulcer . . . . . E. Stanley Ryerson.
Medical Thoughts, Facts, and Foibles . James S. Sprague.

*Le Journal de Médicine et de Chirurgie*, January, 1911:

Le signe de Koplik, prémonitoire de la rougeole . . J. A. Leduc.
Les nouveaux moyens de diagnostic de la syphilis . . . . . Gustave Archambault.

*Le Bulletin Médical de Québec*, December, 1910:

Rapport du comité nommé par la Société Médicale de Québec, sur les moyens à prendre pour l'utilisation d'un service médicale d'inspection scolaire.
L'autosérothérapie dans le traitement des épanchements des cavités séreuses . . J.-E. Fortier.

*L'Union Médicale du Canada*, January, 1911:

Les albuminuries intermittentes curables d'origine digestive . . . . . Albert LeSage.

*The Canadian Journal of Medecine and Surgery*, February, 1911:

Clinical Points Relating to Bright's Disease . H. B. Anderson.
Chronic Progressive Deafness . . . . Charles M. Stewart.

*The Canada Lancet*, February, 1911:

Epileptic Equivalent . . . . . George A. Young.
A Case of Pericardiotomy . . . . . K. J. Manion.

*Saskatchewan Medical Journal*, December, 1910:

Some Factors Regarding the Treatment of Insanity in Private Practice . . . . Ernest A. Hall.
Recent Observations on the Therapeutic Use of Radium . . . W. H. B. Aikins and F. C. Harrison.

XUM

# Medical Societies

## MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE ninth regular meeting of the society was held February 3rd.

EXHIBITS. 1. Dr. R. P. Campbell exhibited three rabbits showing syphilitic lesions. The original rabbit of the series had been inoculated about a year previously, and two months later the primary lesion developed. The incubation period for the other rabbits of the series had varied constantly, until in the last the primary lesion of the testicle appeared in twenty-one days, although a nodule could be felt on the fourteenth day. The lesion was in the scrotum in each instance. The rabbits exhibited were the fourth generation since the original rabbit.

2. The Schiötz tonometer, exhibited by Dr. J. W. Stirling,—an instrument used to record the tension of the eye.

DEMONSTRATIONS: PATHOLOGICAL AND CLINICAL. Cancer of the Pelvis: Dr. O. C. Gruner and Dr. W. G. Turner. A case of carcinoma affecting the bones of the pelvis, following cancer of the breast some years previously. The deformity produced by destruction of the sacrum and iliac bones was very striking. The patient was aged forty-six, first began to complain of pain in the small of the back and left hip and heel in January, 1909. The pain was of a dull, aching character, and the patient sometimes could not sleep at night. Two or three years previously a small tumour had been removed from the breast. It was thought to be tuberculous. Patient entered the hospital in July, and in October a mass appeared on the left side which was fluctuating and thought to be a cold abscess. Two litres of almost clear fluid were removed, showing thick, grumous sediment. A week later a similar amount was removed, and though it showed no cultural characteristics, and a snipping examined proved negative, the rapid secretion of this abscess and the scar on the right breast decided a diagnosis of carcinoma. The patient died February 17th, practically thirteen months from the onset of symptoms. Temperature 100–100·4° during the day, normal in the morning. The case was discussed by Drs. Elder, Russel, and Martin.

Empyæma and Tricuspid Regurgitation: Dr. O. C. Gruner and Dr. E. W. Archibald. A case of tricuspid endocarditis associated with empyæma. The patient had the signs of empyæma and some cerebral symptoms which were thought to be due to embolism. The autopsy

showed only a limited empyæma, but malignant endocarditis and a septic embolus in the left lung. There was also meningitis.

Tumour of the Mediastinum. Dr. W. A. Molson and Dr. O. R. Waugh. The chief clinical signs were prominence of the chest in front, and dulness on percussion over the whole chest anteriorly, except above the second interspace on both sides and in the axillæ. Autopsy showed a very extensive mediastinal sarcoma of doubtful origin, which involved many of the mediastinal contents. There was no evidence of metastases. The specimen showed the anterior thoracic wall, part of the subcutaneous tissue and contents of the thoracic cavity. A window had been cut through the sternum through which could be seen the tumour mass filling the anterior mediastinum. This case was discussed by Drs. Martin, Rhea, and Elder.

PAPER: By Dr. J. C. Meakins and Dr. L. S. Foster. The following is a synopsis: The results of the administration of vaccine in the prophylaxis and treatment of typhoid fever. An analysis of cases treated by other workers. Synopsis of writer's cases. Cases most suitable for vaccination. Indications. Results. Conclusions. The paper was discussed by Drs. Reilly, Pavey, and Turner.

CASE REPORT: Operative Treatment for Pott's Disease. By Dr. A. Mackenzie Forbes. The case was discussed by Drs. Elder, Turner, and Nutter.

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## OTTAWA MEDICAL SOCIETY

THE Ottawa Medical Society held its regular monthly meeting February 10th, in the Carnegie library. An interesting paper on "The Present Status of Conservative Gynæcology" was read by Dr. W. Travis Gibb. Dr. Gibb emphasized the reasonableness of the present tendency towards conservatism in the treatment of diseases of the internal genital organs of women, and was of opinion that when surgical intervention became necessary,—it should be avoided whenever possible,—the preservation of an organ or a portion of one which may be free from disease and able to functionate, and whose integrity is so important to the woman, should be looked upon as the height of gynæcological skill. The conclusions Dr. Gibb had reached in the treatment of gynæcological cases were: (1) to treat the case expectantly as long as there is the slightest chance of recovery without operation; (2) when operation is imperative, to save all the organs or parts of organs possible; (3) as a conservative operation is not necessarily an incomplete operation, to remove all the organs or parts of organs that are so

diseased that to save them would necessarily expose the patient to the dangers of a second operation; and (4) except in extreme cases or in those near or past the menopause, to save the patient her function of ovulation, or at least to leave her some part of ovarian tissue to avoid the psychical disturbance which follows the total oblation of these organs.

## L'ASSOCIATION MEDICALE DU DISTRICT D'OTTAWA

L'Association Médicale du district d'Ottawa held its semi-annual meeting January 17th, at Hull. The following papers were read: "Le froid en thérapeutique," by Dr. S. Lafortune; "Lés aménorrhées," Dr. J. E. D'Amour; "Discussion des cas de pratique," Dr. E. Aubry. In addition, Dr. A. Pelletier made some remarks upon the use of adrenalin in rhinology. Interesting addresses on alcoholism and tuberculosis were delivered by Dr. Dubé, of Montreal, and Dr. Provost, of Ottawa. The Society decided not to enter the proposed union of the French medical societies.

## SOCIETE MEDICALE DE MONTREAL

The secretary's report for 1910 shows that during the year twelve regular and two special meetings were held, at which thirty-six communications of various nature were presented by Drs. Saint-Jacques, Saint-Pierre, Falardeau, Latreille, Laberge, Boucher, Elie, Benoit, Derome, Cléroux, Bourgeois, LeSage, de Martigny, Decarie, Roy, Dupont, Gagnon, Nutter, Foucher, Boulet, Laurent, Hervieux, Fortier, and Lebel. There were, at the close of the year, 146 members in the society. The new members enrolled were, Drs. E. P. Lachapelle, P. A. Robichaud, J. M. Aumont, R. L. Poliquin, Taschereau, Dorval, Hamel, Saint-Pierre, Grenier, and Corsin. Last year death removed two members, Professor Rottot and Dr. P. S. Côté. The officers of the society for 1911 are: president, E. P. Benoit; vice-president, S. Boucher; secretary, Ludovic Verner; assistant secretary, Wilfred Derome; treasurer, J. C. Bourgoin. Meetings are held on the first and third Tuesdays of each month at nine p.m. at Laval University.

## ONTARIO MEDICAL ASSOCIATION

The thirtieth annual meeting of the Ontario Medical Association will be held this year at Niagara Falls on May 30th, 31st, and June 1st.

# Medical Societies

CANADIAN MEDICAL ASSOCIATION :—President—Dr. G. E. Armstrong, Montreal. Secretary—Dr. Edward Archibald, 160 Metcalfe Street, Montreal.

BRITISH COLUMBIA MEDICAL ASSOCIATION :—President—Dr. R. W. IRVING, Kamloops. Secretary—Dr. A. S. Monro, Vancouver.

BRITISH MEDICAL ASSOCIATION, HALIFAX AND NOVA SCOTIA BRANCH :—President—Dr. Arthur Birt. Secretary—Dr. K. A. Mackenzie.

CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS :—President—Dr. J. G. Adami, Montreal. Secretary—Dr. George D. Porter, Ottawa.

CANADIAN HOSPITAL ASSOCIATION :—President—Miss C. F. Green, Belleville. Secretary—Dr. J. N. E. Brown, Toronto.

COLCHESTER-HANTS MEDICAL SOCIETY :—President—Dr. J. N. Reid, Windsor. Secretary—Dr. H. V. Kent, Truro.

LONDON MEDICAL ASSOCIATION :—President—Dr. D. H. Arnott. Secretary—Dr. Edward Spence.

LUNENBURG-QUEEN'S MEDICAL SOCIETY :—President—Dr. W. N. Cochran, Mahone. Secretary—Dr. L. T. N. Penney, Lunenburg.

MANITOBA MEDICAL ASSOCIATION :—President—Dr. F. S. Keele, Portage la Prairie. Secretary—Dr. R. F. Rorke, Winnipeg.

MONTREAL MEDICO-CHIRURGICAL SOCIETY :—President—Dr. C. F. Martin. Secretary—Dr. Hanford McKee.

NOVA SCOTIA MEDICAL SOCIETY :—President—Dr. James Ross. Secretary—Dr. J. R. Corston.

OTTAWA MEDICAL SOCIETY :—President—Dr. F. McKelvey Bell. Secretary—Dr. Omar Wilson.

PICTOU COUNTY MEDICAL ASSOCIATION :—President—Dr. C. J. Miller, New Glasgow. Secretary—Dr. John Bell, New Glasgow.

ST. JOHN MEDICAL SOCIETY :—President—Dr. T. D. Walker. Secretary—Dr. William Warwick.

ST. THOMAS AND ELGIN COUNTY MEDICAL SOCIETY :—President—Dr. S. N. Dorland. Secretary—Dr. Leith.

SOCIÉTÉ MÉDICALE DE MONTREAL :—President—Dr. E. P. Benoit. Secretary—Dr. Ludovic Verner.

THE VALLEY MEDICAL SOCIETY :—President—Dr. P. N. Balcom, Aylesford. Secretary—Dr. W. F. Read, Middleton.

THUNDER BAY MEDICAL ASSOCIATION :—President—Dr. A. J. G. Macdougall. Secretary—Dr. C. C. McCullough.

TORONTO ACADEMY OF MEDICINE :—President—Dr. A. A. MacDonald. Secretary—Dr. J. G. Fitzgerald.

WINNIPEG MEDICO-CHIRURGICAL SOCIETY :—President—Dr. Prowse. Secretary—Dr. John Gunn.

XUM

ASSOCIATION DES MÉDECINS DE LANGUE FRANÇAISE DE L'AMÉRIQUE DU NORD:
President—Dr. H. Hervieux, Montréal. Secretary—Dr. Bourgeois, 232, rue Sherbrooke Ouest, Montréal.
Meets every second year, next reunion in August, 1913, at Montreal.

ASSOCIATION MÉDICALE C. F. DE MANITOBA:
President—Dr. J. M. O. Lambert. Secretary—Dr. G. A. Dubuc, St-Boniface, Man.

ASSOCIATION MÉDICALE DE L'OUEST DE MONTRÉAL:
President—Dr. E. G. Asselin. Secretary—Dr. Aumont, St-Henri.

ASSOCIATION MÉDICALE DU COMTÉ DE JACQUES-CARTIER:
President—Dr. P. A. Valois. Secretary—Dr. Beaudoin, Lachine.

ASSOCIATION MÉDICALE DU COMTÉ DE PORTNEUF:
President—Dr. A. Larue Secretary—Dr. Thos. Savary, Pont-Rouge.

ASSOCIATION MÉDICO-CHIRURGICALE DU DISTRICT DE JOLIETTE:
President—Dr. C. Bernard. Secretary—Dr. A. Roch, St-Gabriel de Brandon.

SOCIÉTÉ MÉDICALE DE CHICOUTIMI ET DU LAC ST-JEAN:
President—Dr. Poliquin. Secretary—Dr. A. Riverin, Chicoutimi.

SOCIÉTÉ MÉDICALE DE MONTMAGNY:
President—Dr. Gosselin. Secretary—Dr. Paradis, Montmagny.

SOCIÉTÉ MÉDICALE DE QUÉBEC:
President—Dr. D. Brochu. Secretary—Dr. J. Dorion, Québec.

SOCIÉTÉ MÉDICALE DE RIMOUSKI:
President—Dr. L. F. Lepage. Secretary—Dr. J. A. Ross jr., Ste-Flavie Station.

SOCIÉTÉ MÉDICALE DES COMTÉS DE BEAUCE ET DORCHESTER:
President—Dr. Fortier. Secretary—Dr. L. M. Déchêne, Beauceville.
Regular meetings, March, June, September, and December.

SOCIÉTÉ MÉDICALE DE ST-JEAN (IBERVILLE).
President—Dr. Moreau. Secretary—Dr. Duval (St-Jean d'Iberville).

SOCIÉTÉ MÉDICALE DE ST-HYACINTHE:
President—Dr. J. C. S. Gauthier. Secretary—Dr. Viger, de St-Hyacinthe.

SOCIÉTÉ MÉDICALE DE SHEFFORD:
President—Dr. J. A. E. Brun. Secretary—Dr. A. Lessard, Granby, Co. de Shefford, P.Q.
Regular meetings twice a year.

SOCIÉTÉ MÉDICALE DE TROIS-RIVIÈRES:
President—Dr. DeBlois. Secretary—Dr. O. Darche, Trois-Rivières.

SOCIÉTÉ MÉDICALE DE VALLEYFIELD:
President—Dr. Ostigny. Secretary—

SOCIÉTÉ MÉDICALE DU COMTÉ DE CHAMPLAIN:
President—Dr. Trudel. Secretary—Dr. Bellemare, St-Narcisse.

SOCIÉTÉ MÉDICALE DU COMTÉ DE KAMOURASKA:
President—Dr. B. Vézina, St-Alexandre. Secretary—Dr. U. J.-I. Pajeau, de Ste-Anne.
Regular meetings, February, June, and October.

SOCIÉTÉ MÉDICALE DU COMTÉ DE MASKINONGÉ:
President—Dr. L. A. Plante. Secretary—Dr. DuHamel.

SOCIÉTÉ MÉDICALE DU COMTÉ DE TERREBONNE:
President—Dr. Grignon. Secretary—Dr. H. Prevost, St-Jérôme.

SOCIÉTÉ MÉDICALE DU COMTÉ DE WOLFE:
President—Dr. Thibault. Secretary—Dr. A. Pelletier, St-Camille.
Regular meetings, the first Tuesday of March, June, September, and December.

SOCIÉTÉ MÉDICALE DU DISTRICT D'OTTAWA:
President—Dr. Aubry. Secretary—Dr. J. E. D'Amour, Papineauville.